MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

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INTRODUCTION.

The REVIEW for December, 1895, is based on reports from 2,737 stations occupied by regular and voluntary observers, classified as follows: 149 from Weather Bureau stations; 35 from U. S. Army post surgeons; 2,395 from voluntary observers; 32 from Canadian stations; 96 received through the Southern Pacific Railway Company; 30 from U. S. Life-Saving stations; international simultaneous observations are received from a few stations and used together with trustworthy newspaper extracts and special reports.

The WEATHER REVIEW is prepared under the general editorial supervision of Prof. Cleveland Abbe. Unless otherwise specifically noted, the text is written by the Editor, but the statistical tables are furnished by Mr. A. J. Henry, Chief of the Division of Records and Meteorological Data. A special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada.

CLIMATOLOGY OF THE MONTH.

GENERAL CHARACTERISTICS.

The current month has been characterized by a remarkable series of severe storms in the North Atlantic, affecting both the coasts of Europe and America. An equally remarkable series of storms prevailed in the North Pacific, affecting not only the coasts of Washington, British Columbia, and Alaska, but also the coast of Japan. A series of remarkable rains, with high winds and resulting floods in the rivers, occurred in Kansas, Missouri, and Texas. The average pressure was above normal on the Atlantic and Pacific coasts, but decidedly below normal in the Dakotas, Manitoba, and Alberta. Temperature was above normal in the latter region, but below in the Rocky Mountain Plateau and Pacific Slope and Gulf States. Precipitation was decidedly above normal on the coasts of Washington and Oregon, as also from Texas to the Lake Region, and was at several stations in this region the greatest on record.

ATMOSPHERIC PRESSURE.

[In inches and hundredths.]

The distribution of mean atmospheric pressure reduced to sea level, as shown by mercurial barometers, not reduced to standard gravity, and as determined from observations taken daily at 8 a. m. and 8 p. m. (seventy-fifth meridian time), is shown by isobars on Chart II. That portion of the reduction to standard gravity that depends on latitude is shown by the numbers printed on the right-hand border.

The *mean pressures* during the current month were highest in the Rocky Mountain Plateau Region and southeastward to southern Texas. A ridge of moderate high pressure extended from New Jersey and eastern New York southwestward to the Gulf of Mexico. The highest were: Salt Lake City, 30.36; Idaho Falls, 30.33; Winnemucca, 30.31; Carson City, 30.27; Lander, 30.25. The lowest mean pressures were in the Canadian Provinces. The lowest were: Swift Current, 29.83; Calgary and Minnedosa, 29.85; Battleford, 29.87; Edmonston and Qu'Appelle, 29.88; Winnipeg, 29.89.

As *compared with the normal* for December, the mean pressure was in excess along the Atlantic, Pacific, and Gulf coasts and over the Rocky Mountain Plateau Region. The greatest excesses were: Philadelphia and Harrisburg, 0.16; Halifax, 0.15; Sydney, 0.14; Salt Lake City, 0.12. The greatest deficits were: Swift Current, 0.30; Calgary, 0.27; Minnedosa, 0.25; Qu'Appelle, 0.24; Winnipeg and Williston, 0.21.

As *compared with the preceding month* of November, the pressures, reduced to sea level, show a decided rise in California, Utah, and Arizona, and a decided fall in Manitoba, Saskatchewan, and Athabasca. The greatest rises were: Fresno, 0.17; Independence and Sacramento, 0.15; San Francisco, Red Bluff, and Salt Lake City, 0.14. The greatest falls were: Qu'Appelle, 0.18; St. John's, Edmonston, and Minnedosa, 0.17; Williston, 0.16.

AREAS OF HIGH AND LOW PRESSURE.

By Prof. H. A. HAZEN.

The month of December was remarkable for the fewness of the high areas which crossed the country and the very great number of low areas. Of the former, there were but three, with a total duration of twelve days, but of lows there were fourteen, with a duration of forty-seven days. The velocity of the highs was 20 miles per hour, that of the lows was nearly 32 miles per hour. The accompanying table exhibits some of the facts relating to the movement of each high and low, and Charts IV and I give the tracks of their centers. Chart I shows that the general tendency of the lows has been to take a rather high latitude, though there have been a few severe Gulf storms.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long W.	Length.	Duration.	Daily.	Hourly.
High areas.		°	°		°	°	*Miles.*	*Days.*	*Miles.*	*Miles.*
I	1, a. m.	54	109	7, a. m.	32	83	3,110	6.0	518	21.6
II	6, p. m.	55	107	10, a. m.	38	80	1,600	3.5	457	19.0
III	15, a. m.	51	89	17, p. m.	41	to*	*,205	2.5	482	20.1
Sums							5,915	12.0	1,457	
Average of 3 paths									486	20.2
Average of 12 days									493	20.6
Low areas.										
I	1, a. m.	36	93	3, a. m.	47	61	1,805	2.0	903	37.6
II	3, p. m.	47	84	6, a. m.	49	55	1,985	2.5	794	33.1
III	4, a. m.	48	129	8, a. m.	48	60	5,390	4.0	847	35.3
IV	8, a. m.	38	94	12, a. m.	47	55	2,570	4.0	642	26.7
V	8, p. m.	49	129	15, p. m.	47	57	4,715	7.0	674	28.1
VI	11, p. m.	55	114	14, p. m.	49	84	1,375	3.0	458	19.1
VII	14, a. m.	49	126	18, a. m.	49	89	2,230	4.0	558	23.2
VIII	17, a. m.	33	106	21, a. m.	44	85	2,015	4.0	504	21.0
IX	19, a. m.	48	127	23, a. m.	51	61	3,480	4.0	870	36.2
X*	23, a. m.	54	117							
Xa	23, p. m.	28	100	25, p. m.	51	89	1,645	2.0	822	34.2
XI	25, a. m.	53	117	26, p. m.	43	96	1,160	1.5	773	32.2
XII	25, p. m.	33	89	27, p. m.	50	63	1,720	2.0	860	35.8
XIII	26, p. m.	53	119	29, p. m.	51	83	1,740	3.0	580	24.2
XIV	28, a. m.	38	103	31, p. m.	52	65	3,100	3.5	1,240	51.7
Sums							32,930	46.5	10,525	
Mean of 14 paths									752	31.3
Mean of 46.5 days									709	29.5

*Coalesced with Xa.

HIGH AREAS.

I.—The highest pressure of the month, 30.84, was noted on the first day to the north of Montana. The central high pressure moved rapidly southward to Texas, where it remained nearly stationary for two days and then moved east, reaching the Florida coast on the 7th, a. m. During the progress of this high the pressure remained far above the normal in Montana, but with no motion. The lowest temperature of the month accompanied this high, —24°, at Havre on the 2d, a. m. A notable cold wave, with a fall in temperature of 30°, at Pittsburg on the 3d, a. m., and at Boston p. m. of the same day, was due in part to the cold air drawn from this high into the rear of low No. I.

II.—This high first appeared north of Montana on the 6th, p. m. Like No. I, its motion was southward, reaching Missouri on the 9th. It was last noted in southern Illinois on the 10th, a. m. During its progress an area of high pressure remained stationary in the middle Plateau Region. On the 8th, p. m., a ridge of high pressure connected the two highs. It may be said that No. II was gradually absorbed by the rather permanent high in the Plateau Region.

III.—The pressure continued high and without motion in the Plateau Region till the 14th, a. m. High area No. III appeared to the north of Lake Superior on the 15th, a. m. The first intimation of the presence of No. III came from the winds which began to blow from the northwest, though there was a high area in the southeast, which was the lower part of a ridge of stationary high pressure trending southwest and northeast. The pressure at White River rose 0.22 in the next twelve hours; at Rockliffe it rose 0.52 in twenty-four hours. Area No. III moved toward the south of east, and disappeared in the Atlantic off the New England Coast on the 17th, p. m. After reaching the Atlantic a high pressure area remained nearly stationary until the 27th, forming one of the notable features of the weather during the month. The pressure continued high and without motion from the 16th to the end of the month in the Plateau Region, with one or two slight additions of high pressure from the Pacific Ocean. The position of this permanent high pressure area in the Plateau Region, the lingering of high pressure off the Atlantic Coast, and the high temperature over nearly the whole country were the prominent features of the month.

LOW AREAS.

I.—The month opened with a trough of low pressure extending from Texas to Lake Superior, with a special slight depression in Arkansas. This trough moved northeast and disappeared in the Gulf of St. Lawrence on the 3d, a. m. A maximum velocity of 38 miles per hour was noted at Eastport on the 2d, p. m. The heaviest rainfall in twelve hours was 1.64 inch at Halifax on the 3d, a. m.

II.—First noted to the north of Lake Superior on the 3d, p. m. It moved to the south of east, reaching the Atlantic on the 5th, p. m. Then it moved very rapidly to Newfoundland in the next twelve hours. A wind velocity of 52 miles per hour was reported at Eastport on the 6th, a. m. The precipitation attending this storm was very small, though widely distributed in the interior; on reaching the coast the rain increased, 1.17 inch being reported from St. Johns on the 6th, a. m.

III.—This storm was first noted off the north Pacific Coast on the 4th, a. m. Its motion was nearly due east, and it reached the Gulf of St. Lawrence on the 8th, a. m. The highest wind reported was 46 miles per hour at Duluth on the 7th, a. m.

IV.—First noted in southwest Arkansas on the 8th, a. m. It reached the Atlantic Coast of north Florida in two days, then turned northeast and reached Newfoundland on the 12th, a. m. A wind of 65 miles per hour was reported from New York, N. Y., on the 11th, a. m., and one of 68 miles at Block Island on the 11th, p. m., but this was partly brought about by the proximity of low No. V in Kentucky.

V.—First noted off the north Pacific Coast on the 8th, p. m. Its apparent motion was east and southeast, reaching the south Atlantic Coast on the 12th, p. m., then it turned northeast and reached Newfoundland on the 15th, p. m. A wind of 68 miles was reported at Kittyhawk on the 13th, p. m. This low was notable for the length of its path and for the meager rainfall throughout its course.

VI.—First noted to the north of Montana on the 11th, p. m. Its path lay to the north of telegraph stations of observation and disappeared on the 14th, p. m., to the north of Lake Superior.

VII.—First noted off the north Pacific Coast on the 14th, a. m., where it was a very severe storm. A wind of 55 miles was reported from Fort Canby on the 14th, p. m., and at the same time a rainfall of 0.92 inch in twelve hours was reported from Seattle. The path of No. VII was eastward and it disappeared over Lake Superior on the 18th, a. m. A cold wave followed in the rear of this storm over the region west of the Mississippi River. A fall in temperature of 32° was reported at Helena on the 16th, a. m., and at Pueblo on the 17th, a. m

VIII.—Originated in New Mexico on the 17th, a. m. Its course was northeastward for four days and disappeared in Michigan. Very heavy precipitation attended or preceded this storm as it moved northward, though almost none was noted on the Gulf. At Springfield, Ill., 6.66 inches fell between 17th, a. m., and 20th, a. m., and 5.06 inches at Chicago during the same time. It is a little remarkable that with all this rainfall the violence of the storm rapidly diminished and it had entirely disappeared on the 21st.

IX.—First noted off north Pacific Coast on the 19th, a. m. Its course was eastward, largely beyond stations of observation, and it disappeared in the Gulf of St. Lawrence on the 23d, a. m. A wind of 48 miles was reported at Buffalo on the 22d, a. m.

X.—A depression had existed to the north of Montana for several days, but it did not appear to move till the 23d, a. m.,

when a pressure of 28.88 was reported from Edmonton. In twenty-four hours the lowest pressure was in Manitoba. This storm cannot be traced farther, but it may have inflenced or coalesced with No. X*a*.

X*a*.—First noted in southern Texas on the 23d, p. m. Its motion was very rapid north-northeast, and it was last noted to the north of Lake Superior on the 25th, p. m. A widely extended cold wave followed in the wake of this storm and continued behind low area No. XII. The heaviest rainfall was 1.52 inch in twelve hours at Kansas City, which is in marked contrast to the precipitation accompanying low No. VIII, though the two storms had almost exactly the same trajectory.

XI.—First noted to the north of Montana on the 25th, a. m. This storm either filled up in South Dakota on the 26th, p. m., or was absorbed by No. XIII. Only traces or very light rains accompanied it.

XII.—A trough-like depression extending from the Gulf of Mexico to Lake Huron was left by area No. X*a*. On 25th p. m., the map shows a slight concentration of this trough in Mississippi. Over 2.50 inches of rain in twenty-four hours fell at Meridian. This storm moved rather rapidly in a northeast direction and was last noted at the mouth of the St. Lawrence on the 27th, p. m. Abundant rainfall characterized the onward progress of this depression. The highest wind of the month, 72 miles, was reported from New York, N. Y., on the 27th, a. m. The same velocity was again reported on the 31st, a. m. A continuation of the cold wave accompanying No. X*a* caused a fall of 36° in twenty-four hours at Parkersburg. This was the most widely extended and severest cold wave of the month in the eastern portion of the United States.

XIII.—This low was first noted to the north of Montana on the 26th, p. m. Its course was a little south of east, and it was last noted to the north of Lake Superior on the 29th, p. m. It was followed by a severe cold wave in the Missouri Valley and middle Slope, a fall of 34° in twenty-four hours and to 4° being reported at Cheyenne on the 28th, p. m., and one of 34° and to —2° at Moorhead on the 29th, a. m. A wind of 38 miles was felt at Marquette on the 28th, a. m., and at Duluth on the 29th, a. m. Almost no precipitation attended this low, though the pressure reached 29.00 near its center on the 27th, a. m.

XIV.—First noted in Colorado on the 28th, a. m., within a trough extending to and including No. XIII in Minnesota. Its course was southeast, reaching the Gulf of Mexico the next morning. Thence it moved northeast, reaching the mouth of the St. Lawrence on the 31st, p. m. The lowest pressure of the month, 28.84, was reported from Quebec on the 31st, a. m. Rather heavy rains attended this storm.

LOCAL STORMS.

By A. J. HENRY, Chief of Division of Records and Meteorological Data.

No local storms, properly so called, were reported during December; the numerous cases of high winds are given under that heading.

TEMPERATURE OF THE AIR.

[In degrees Fahrenheit.]

The mean temperature is given for each station in Table II, for voluntary observers. Both the mean temperatures and the departures from the normal are given in Table I for the regular stations of the Weather Bureau.

The *monthly mean temperature* published in Table I, for the regular stations of the Weather Bureau, is the simple mean of all the daily maxima and minima; for voluntary stations a variety of methods of computation is necessarily allowed, as shown by the notes appended to Table II.

The *regular diurnal period* in temperature is shown by the hourly means given in Table IV for 29 stations selected out of 82 that maintain continuous thermograph records.

The *distribution* of the monthly mean temperature of the air over the United States and Canada is shown by the dotted isotherms on Chart II; the lines are drawn over the high irregular surface of the Rocky Mountain Plateau, although the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the country occupied by our observers; such isotherms are controlled largely by the local topography, and should be drawn and studied in connection with a contour map.

The *highest mean* temperatures were: Key West, 67.8; Jupiter, 64.4; Tampa, 59.2; Port Eads, 58.4; Corpus Christi, 56.9. The *lowest mean* temperatures were: In Canada: Edmonton, 14.9; Battleford, 6.5; White River, 11.2; Winnipeg, 8.2; Minnedosa, 8.1; Qu'Appelle, 8.8. In the United States: St. Vincent, 10.2; Moorhead, 14.4; Williston, 16.0.

As *compared with the normal* for December, the mean temperatures for the current month were deficient throughout the Rocky Mountain Plateau Region, the Pacific Coast, and the South Atlantic and Gulf States, but were in excess throughout Canada, the Lake Region, the Middle States, and New England. The greatest excesses were: Pierre, 6.0; Minnedosa, 5.6; Medicine Hat, 5.4; Chatham, 5.3; Williston, 5.0. The greatest deficits were: Salt Lake City, 8.1; Santa Fe, 6.8; Winnemucca, 5.0; Pensacola, 4.3; Phœnix, 4.2; Lander, 4.0.

Considered by districts the mean temperatures for the current month show departures from the normal as given in Table I. The greatest positive departure was: North Dakota, 3.5. The greatest negative departures were: Middle Plateau, 4.7; Southern Plateau, 4.2.

The years of highest and lowest mean temperatures for December are shown in Table I of the REVIEW for December, 1894. The mean temperature for the current month was not the highest on record at any regular station of the Weather Bureau. It was the lowest on record at: Tampa, 59.2; Salt Lake City, 26.4; Fresno, 43.6; San Francisco, 48.6; Point Reyes Light, 48.0.

The *maximum and minimum temperatures* of the current month are given in Table I. The highest maxima were: 86, Los Angeles (frequently); 81, Jupiter (26th); 80, Jacksonville (2d), Tampa (1st), Key West (26th), Yuma (12th), San Luis Obispo (11th). The lowest maxima were: 38, St. Vincent (15th); 40, Dubuque (17th); 41, Idaho Falls (20th); 42, Minneapolis (17th); 43, Moorhead (28th); 44, Williston (27th). The highest minima were: 52, Key West (14th); 39, Jupiter (14th), San Francisco (30th), Point Reyes Light (frequently). The lowest minima were: —24, Havre (2d); —22, St. Vincent (26th); —18, Bismarck (2d); —17, Moorhead, (2d).

The years of highest maximum and lowest minimum temperatures are given in the last four columns of Table I of the current REVIEW. During the present month the maximum temperatures were the highest on record at: Northfield, 61; Nantucket, 59; Vineyard Haven, 62; Buffalo, 63; Fresno, 71; Carson City, 65; Roseburg, 66; Port Angeles, 64; Tatoosh Island, 60. The minimum temperatures were the lowest on record at: Columbia, 10; Fresno, 6; Eureka, 0.

The greatest daily range of temperature and the extreme monthly ranges are given for each of the regular Weather Bureau stations in Table I, which also gives data from which may be computed the extreme monthly ranges for each station. The largest values of the greatest daily ranges were: Carson City, 44; Lander and Pueblo, 43; Denver and El Paso, 42; Jacksonville, St. Vincent, Huron, Rapid City, and San Luis Obispo, 41. Among the extreme monthly ranges the largest values were: Havre, 84; Northfield, 74; Columbia, Mo., 69; Rapid City, 67; Bismarck, Huron, Pueblo, 66. The smallest values were: San Francisco, 21; Point Reyes

Light, 24; Fort Canby, 25; Astoria and Portland, Oreg., 27; Key West, 28; Tatoosh Island, 29.

The *accumulated monthly departures* from normal temperatures from January 1 to the end of the current month are given in the second column of the following table, and the average departures are given in the third column, for comparison with the departures of current conditions of vegetation from the normal conditions.

Districts.	Accumulated departures.		Districts.	Accumulated departures.	
	Total.	Average.		Total.	Average.
	°	°		°	°
New England	+ 4.6	+ 0.4	Middle Atlantic	— 7.3	— 0.6
Upper Lake	+ 0.2	0.0	South Atlantic	—17.7	— 1.5
North Dakota	+ 3.7	+ 0.3	Florida Peninsula	—16.6	— 1.4
Missouri Valley	+ 2.4	+ 0.2	East Gulf	—20.6	— 1.7
Northern Plateau	+ 0.8	+ 0.1	West Gulf	—20.6	— 1.7
			Ohio Valley and Tenn.	—13.1	— 1.1
			Lower Lake	— 6.9	— 0.6
			Upper Mississippi	— 1.9	— 0.2
			Northern Slope	—11.9	— 1.0
			Middle Slope	— 6.3	— 0.5
			Abilene (southern Slope)	—23.1	— 1.9
			Southern Plateau	—12.4	— 1.0
			Middle Plateau	—17.1	— 1.4
			North Pacific	— 4.0	— 0.3
			Middle Pacific	— 9.5	— 1.8
			South Pacific	—10.0	— 0.8

The limit of freezing weather is shown on Chart VI by the isotherm of minimum 32, and the limit of frost by the isotherm of minimum 40.

MOISTURE.

The *quantity of moisture* in the atmosphere at any time may be expressed by the weight contained in a cubic foot of air, or by the tension or pressure of the vapor, or by the temperature of the dew-point. The mean dew-points for each station of the Weather Bureau, as deduced from observations made at 8 a. m. and 8 p. m., daily, are given in Table I.

The *rate of evaporation* from a special surface of water on muslin at any moment determines the temperature of the wet-bulb thermometer, but a properly constructed evaporometer may be made to give the *quantity* of water evaporated from a similar surface during any interval of time. Such an evaporometer, therefore, would sum up or integrate the effect of those influences that determine the temperature as given by the wet bulb; from this quantity the *average humidity of the air* during any given interval of time may be deduced.

Sensible temperatures.—The sensation of temperature experienced by the human body and ordinarily attributed to the condition of the atmosphere depends not merely on the temperature of the air, but also on its dryness, on the velocity of the wind, and on the suddenness of atmospheric changes, all combined with the physiological condition of the observer. The condition of the atmosphere as to moisture is so important that it has, by exaggeration, been sometimes considered as a controlling feature and the temperature of the wet-bulb thermometer, when whirled in the shade, has been called the sensible temperature, although this is often but a partial index of the sensation of temperature. In order to present a monthly summary of the atmospheric conditions on which hygienic and physiological phenomena depend, the moisture must be fully considered, and therefore Table VIII has been prepared, showing the maximum, minimum, and mean readings of the wet-bulb thermometer at 8 a. m. and 8 p. m., seventy-fifth meridian time. A complete expression for the relation between atmospheric conditions and nervous sensations is under consideration, but has not yet been obtained.

PRECIPITATION.

[In inches and hundredths.]

The *distribution of precipitation* for the current month, as determined by reports from about 2,500 stations, is exhibited on Chart III. The numerical details are given in Tables I, II, and III. The total precipitation for the current month was heaviest, 20.00 to 25.00, on the immediate coasts of Oregon and Washington. A region of heavy precipitation, 10.00 to 12.00, extends from central Oklahoma, northeast to central Missouri. This latter feature in the distribution of rain and snow is due to the fact that the heaviest precipitation in this region occurred in belts extending northeast and southwest between a system of warm southeast winds and cold north winds on December 18th, 19th, and 20th.

The *diurnal variation* is shown by Table XII, which gives the total precipitation for each hour of seventy-fifth meridian time, as deduced from self-registering gauges kept at about 43 regular stations of the Weather Bureau; of these 37 are float gauges and 6 are weighing gauges.

The *normal precipitation* for each month is shown in the Atlas of Bulletin C, entitled "Rainfall and Snow of the United States, compiled to the end of 1891, with annual, seasonal, monthly, and other charts."

The *current departures* from the normal precipitation are given in Table I, which shows that there was an excess in northern Texas and thence northeastward over the Lake Region, also in western Oregon and Washington. There was a deficiency throughout the Atlantic and Gulf coasts, California and the Rocky Mountain Plateau.

Large excesses were: Neah Bay, 9.4; Tatoosh Island, 8.7; Springfield, Mo., 8.6; Astoria, 6.5; Columbia, Mo., 6.8; Springfield, Ill., 5.6; Chicago, 4. 4; Jupiter, 4.3. The large deficits were: San Francisco, 3.8; Los Angeles, 3.7; Point Reyes Light, 3. 6; Shreveport, 3.1.

The *average departure* for each district is also given in Table I. By dividing these by the respective normals the following corresponding percentages are obtained (precipitation is in excess when the percentages of the normals exceed 100):

Above the normal: Florida Peninsula, 128; Ohio Valley and Tennessee, 111; lower Lake, 155; upper Lake, 144; upper Mississippi, 149; Missouri, Valley, 281; Abilene, (southern Slope), 211; north Pacific, 146.

Normal: Middle Slope, 100.

Below the normal: New England, 86; Middle Atlantic, 91; South Atlantic, 66; east Gulf, 85; west Gulf, 83; North Dakota, 60; northern Slope, 65; southern Plateau, 56; middle Plateau, 57; northern Plateau, 86; middle Pacific, 55; southern Pacific 22.

The *total accumulated monthly departures* from normal precipitation, from January 1 to the end of the current month, are given in the second column of the following table; the third column gives the ratio of the current accumulated precipitation to its normal value.

Districts.	Accumulated departures.	Accumulated precipitation.	Districts.	Accumulated departures.	Accumulated precipitation.
	Inches.	*Per ct.*		*Inches.*	*Per ct.*
Florida Peninsula	+ 0.70	101	New England	— 5.30	88
Abilene (southern Slope)	+ 7.20	126	Middle Atlantic	— 9.10	80
Southern Plateau	+ 0.40	104	South Atlantic	— 6.30	51
			East Gulf	— 8.60	85
			West Gulf	— 6.70	87
			Ohio Valley and Tenn.	—11.00	76
			Lower Lakes	— 5.80	83
			Upper Lakes	— 7.00	79
			North Dakota	— 1.10	94
			Upper Mississippi	— 7.80	78
			Missouri Valley	— 2.90	91
			Northern Slope	— 0.40	97
			Middle Slope	— 1.60	93
			Middle Plateau	— 2.60	80
			Northern Plateau	— 4.50	73
			North Pacific	— 4.10	93
			Middle Pacific	— 5.60	81
			South Pacific	— 5.40	68

The years of greatest and least precipitation for December are

given in the REVIEW for December, 1894. The precipitation for the current month was the greatest on record at: Jupiter, 6.27; Lexington, 5.50; Chicago, 6.76; Springfield, Ill., 8.08; Springfield, Mo., 11.02; Kansas City, 5.12; Miles City, 0.77; Astoria, 17.54. It was the least on record at: Minneapolis, 0.15; Sioux City, 0.02; Pierre, 0.01; Lander, trace.

Details as to *excessive precipitation* are given in Tables XIII and XIV.

The *total monthly snowfall* at each station is given in Table II. Its geographical distribution is shown on Chart No. VI. The southern limit of freezing temperatures and possible snow is shown on this chart by the isotherm of minimum 32°. The isotherm of minimum 40°, namely, the air temperature within the thermometer shelter, is also given on this chart, and shows approximately the southern limit of frost on exposed surfaces.

The depth of snow on the ground at the close of the month is shown on Chart VII.

HAIL.

The following are the dates on which hail fell in the respective States:

Arizona, 17. Arkansas, 20. California, 15, 16, 17. Delaware, 31. Georgia, 29. Illinois, 17. Kansas, 16. Nebraska, 16. South Carolina, 26. Texas, 18, 29. Washington, 12, 20, 21, 23, 27.

SLEET.

The following are the dates on which sleet fell in the respective States:

Alabama, 4, 12, 28, 30. Arkansas, 11, 20, 29, 30. California, 15, 19, 20. Georgia, 10. Idaho, 6, 25, 27. Illinois, 1, 10, 11, 19, 20, 22, 24. Indiana, 2, 11, 16, 21. Iowa, 1, 17 to 20, 24, 25, 28. Kansas, 1, 2, 17, 18, 19, 22, 24. Kentucky, 3, 8, 20, 25, 30. Louisiana, 20, 27, 29, 30. Maryland, 8, 21, 26, 28, 30. Michigan, 1, 12, 16, 17, 19, 23. Minnesota, 10, 16, 17, 21, 28. Mississippi, 20, 27, 29, 30. Missouri, 1, 11, 12, 17 to 20, 24, 25, 29. Montana, 14, 27. Nebraska, 20, 22, 23. Nevada, 17 to 20. New Hampshire, 22. New Jersey, 8. New York, 2, 6, 15, 17, 26, 27, 30, 31. North Carolina, 9, 10, 28, 30, 31. North Dakota, 9, 17, 28. Ohio, 2, 8, 12, 21, 25, 26, 27, 30, 31. Oklahoma, 2, 17, 19, 23. Oregon, 5, 12 to 16, 18 to 24, 27, 28, 29, 31. Pennsylvania, 2, 26, 30, 31. South Carolina, 4, 10, 27, 28, 31. Tennessee, 2, 28, 29, 30. Texas, 23, 25, 29. Utah, 13. Vermont, 26. Virginia, 9, 26, 30. Washington, 2, 5, 13, 15, 18, 19, 20, 22, 23, 26, 27, 29, 31. West Virginia, 26, 30, 31. Wisconsin, 11, 17, 19, 20, 25, 28.

WIND.

The *prevailing winds* for December, 1895, viz, those that were recorded most frequently, are shown in Table I for the regular Weather Bureau stations.

The *resultant winds*, as deduced from the personal observations made at 8 a. m. and 8 p. m., are given in Table IX. These latter resultants are also shown graphically on Chart II, where the small figure attached to each arrow shows the number of hours that this resultant prevailed, on the assumption that each of the morning and evening observations represents one hour's duration of a uniform wind of average velocity. These figures indicate the relative extent to which winds from different directions counterbalanced each other.

HIGH WINDS.

Maximum wind velocities of 50 miles or more per hour were reported at regular stations of the Weather Bureau as follows (maximum velocities are averages for five minutes; extreme velocities are gusts of shorter duration, and are not given in this table):

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
		Miles				*Miles*	
Block Island, R. I	11	68	ne.	Kittyhawk, N. C	10	60	n.
Do	13	56	ne.	Do	13	66	n.
Do	14	60	ne.	Lexington, Ky	26	60	sw.
Do	27	55	sw.	Nantucket, Mass	11	51	e.
Do	31	57	sw.	New Haven, Conn	27	55	s.
Boston, Mass	31	50	s.	New York, N. Y	26	70	s.
Buffalo, N. Y	7	50	w.	Do	27	73	w.
Do	22	50	sw.	Do	30	50	se.
Do	31	78	w.	Do	31	72	w.
Cheyenne, Wyo	27	50	w.	Oswego, N. Y	31	50	w.
Chicago, Ill	11	54	ne.	Philadelphia, Pa	26	50	sw.
Denver, Colo	30	60	nw.	Portland, Oreg	31	53	se.
Eastport, Me	5	54	ne.	Pueblo, Colo	30	51	w.
Do	6	50	n.	Rochester, N. Y	31	52	sw.
Do	27	54	se.	Tatoosh Island, Wash	3	52	ne.
Do	31	54	se.	Do	11	50	s.
Fort Canby, Wash	2	52	e.	Do	14	52	sw.
Do	9	66	s.	Do	19	60	sw.
Do	11	60	s.	Do	22	60	s.
Do	14	55	s.	Do	23	69	w.
Do	19	60	s.	Do	25	52	w.
Do	22	60	s.	Do	26	56	s.
Do	23	70	s.	Do	27	52	w.
Do	25	50	s.	Do	31	58	s.
Do	26	56	s.	Williston, N. Dak	27	54	w.
Do	29	60	s.	Do	28	50	nw.
Do	31	72	s.	Do	29	52	nw.
Hatteras, N. C	10	60	n.	Winnemucca, Nev	15	54	sw.
Do	11	52	n.	Do	20	56	sw.
Do	13	56	n.	Do	28	58	nw.
Do	31	56	nw.	Woods Hole, Mass	6	52	nw.
Huron, S. Dak	15	52	se.	Do	27	54	se
Independence, Cal	28	53	n.	Do	31	66	sw.

SUNSHINE AND CLOUDINESS.

The quantity of sunshine, and therefore of heat, received by the atmosphere as a whole is very nearly constant from year to year, but the proportion received by the surface of the earth depends upon the absorption by the atmosphere, and varies largely with the distribution of cloudiness. The sunshine is now recorded automatically at 16 regular stations of the Weather Bureau by its photographic, and at 21 by its thermal effects. At one station records are kept by both methods. The photographic record sheets show the apparent solar time, but the thermometric sheets show seventy-fifth meridian time; for convenience the results are all given in Table XI for each hour of local mean time.

Photographic and thermometric registers give the duration of that intensity of sunshine which suffices to make a record, and, therefore, they generally fail to record for a short time after sunrise and before sunset, because, even in a cloudless sky, the solar rays are then too feeble to affect the self-registers. If, therefore, such records are to be used for determining the amount of cloudiness, they must be supplemented by special observations of the sky near the sun at these times. The duration of clear sky thus specially determined constitutes the so-called twilight correction (more properly a low-sun correction), and when this has been applied, as has been done in preparing Table XI, there results a complete record of clear sky from sunrise to sunset in the neighborhood of the sun. The twilight correction is not needed when the self-registers are used for ascertaining the duration of a special intensity of sunshine, but is necessary when the duration of cloudiness is alone desired, as is usually the case.

The cloudiness is determined by numerous personal observations at all stations during the daytime, and is given in the column of "average cloudiness" in Table I; its complement, or percentage of clear sky, is given in the last column of Table XI.

COMPARISON OF DURATIONS AND AREAS.

The sunshine registers give the *duration* of direct sunshine whence the percentage of duration of possible sunshine is derived; the observer's personal estimates give the percentage of *area* of clear sky. These numbers have been brought

together, side by side, in the following table, from which it appears that, in general, the instrumental record of percentages of duration of sunshine is almost always larger than the observers' personal estimate of percentages of area of clear sky; the average excess for December, 1895, is 4.5 per cent for photographic records, and 4.5 per cent for thermometric records. The details are shown in the following table:

Difference between instrumental and personal observations of sunshine.

Photographic stations.	Instrumental.	Personal.	Difference.	Thermometric stations.	Instrumental.	Personal.	Difference.
Phœnix, Ariz.	88	77	11	New Orleans, La	61	60	1
San Diego, Cal.	88	74	14	Portland, Me	60	46	14
Santa Fe, N. Mex	82	70	12	Wilmington, N. C.	60	55	5
Denver, Colo	79	60	19	San Francisco, Cal	58	53	5
Dodge City, Kans.	66	62	4	Vicksburg, Miss	57	54	3
Savannah, Ga	63	57	6	Philadelphia, Pa	56	41	15
Galveston, Tex.	56	55	1	Atlanta, Ga.	53	55	— 2
Eastport, Me	48	37	11	Little Rock, Ark	49	41	8
Kansas City, Mo.	45	41	4	Des Moines, Iowa	48	37	11
Washington, D. C.	44	46	— 2	St. Louis, Mo	48	36	12
Eureka, Cal	38	40	— 2	Boston, Mass	43	37	6
Bismarck, N. Dak	37	48	—11	Rochester, N. Y	43	37	6
Helena, Mont.	34	32	2	New York, N. Y	39	38	1
Cleveland, Ohio	39	39	0	Detroit, Mich.	37	32	5
Salt Lake City, Utah	30	19	11	Baltimore, Md.	36	40	— 4
Portland, Oreg. *	13	20	— 7	Cincinnati, Ohio	33	33	0
				Columbus, Ohio	32	25	7
				Chicago, Ill	28	26	2
				Louisville, Ky	26	24	2
				Buffalo, N. Y.	20	17	3
				Portland, Oreg.*	13	20	— 7

* Records kept by both methods.

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table X, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

The dates on which reports of thunderstorms for the whole area were most numerous, were: 17th, 80; 18th, 34; 19th, 22; 21st, 20.

Thunderstorm reports were most numerous in: Illinois, 23; Iowa, 22; Missouri, 39; Texas, 26.

Thunderstorms were most frequent in: Texas, eleven days; Louisiana, seven days; Illinois and Oregon, six days; Kansas, Missouri, and Nebraska, five days.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz, from the 1st to the 5th, inclusive, and also the 27th to 31st. On the remaining twenty-one days of this month 79 reports were received, or an average of about 4 per day. The dates on which the number of reports especially exceeded this average were: 7th, 11; 8th, 17; 9th, 10th, and 24th, 8.

The ratio of auroras to observers was a large percentage in: North Dakota, 50; New Hampshire, 29; Maine, 31.

Auroras were reported most frequently in: North Dakota, eleven days; Minnesota and Montana, five days; Maine, Massachusetts, Nebraska, and Wisconsin, four days.

CANADIAN DATA—THUNDERSTORMS AND AURORAS.

No thunderstorms were reported.

Auroras were reported as follows: St. Andrews, 8th; Father Point, 8th, 13th; Quebec, 8th; Montreal, 9th; Winnipeg, 5th; Minnedosa, 8th; Qu'Appelle, 7th, 8th; Medicine Hat, 23d, 24th; Swift Current, 10th, 29th; Edmonton, 11th, 20th; Battleford, 19th.

INLAND NAVIGATION.

The *extreme and average stages of water* in the rivers during the current month are given in Table VII, from which it appears that the only river that attained the danger line during the month was the Arkansas, which was 5.6 feet above on the 26th at Fort Smith, and 0.5 feet above at Little Rock on the 29th. This rise in the Arkansas followed the heavy rains and snows on the 17th, 18th, 19th, and 20th, above alluded to in the chapter on precipitation. The effect of the rain that fell on these dates upon the height of the lower Missouri River was very appreciable. The tributaries of the lower Missouri were generally overflowed, and the stages of water were the highest ever known in December. The Arkansas rose 20.1 at Little Rock within four days after the rainfall, and the Missouri rose sufficient to cause a rise of 23.4 in the Mississippi at St. Louis. The general drainage into the Mississippi below St. Louis caused a rise of 17.3 at Memphis; 21.3 at Helena, Ark., 28.1, at Arkansas City, Ark., 23.5, at Greenville, Miss., 26.4, at Vicksburg, all on the 31st, and the water had already risen 3 feet on that date at New Orleans, La. On the 1st of the month the Mississippi at Vicksburg had stood at 4.6 below the zero gauge, which is the lowest stage recorded at that city during any previous December.

ICE IN RIVERS AND HARBORS.

The chart of depth of snow and thickness of ice published weekly shows that on Monday, December 2, the distribution of ice was as follows:

Missouri River.—Miles City, 3.0; Williston, 13.0; Bismarck, 2.0; Pierre, 5.0; Yankton, 6.0; Sioux City, 4.0.

Red River of the North.—Moorehead, 8.0.

Mississippi River.—St. Paul, 3.0; Dubuque, 3.0.

Lake Superior.—Duluth, 5.0.

Lake Michigan.—Green Bay, 2.0.

Lake Huron.—Alpena, 0.5.

During the following week the thickness of ice generally increased in the Mississippi, Missouri, Hudson, and other northern rivers.

By December 16 ice had increased on the lower Lakes but diminished in the Missouri River. By December 23 ice had generally diminished or disappeared in the lower Lakes aad upper Mississippi, but increased in the upper Missouri. On Monday, December 30, the condition of the ice was as follows:

Missouri River.—Miles City, 10.0; Williston, 19.0; Bismarck, 7.0; Pierre, 10.0; Yankton, 7.0; Sioux City, 8.0; Omaha, 2.0; Kansas City, 2.0; below this the thickness was 0.0.

Red River of the North.—Moorhead, 15.0.

Upper Mississippi.—St. Paul, 5.0; La Crosse, 8.0; Dubuque, 2.0; below this the thickness was 0.0.

Ohio River.—Louisville, 0.0.

Tennessee River.—Nashville, 0.0.

Lake Superior.—Duluth, 15.0; Marquette, 1.0.

Lake Michigan.—Green Bay, 4.0.

Lakes Huron, Erie, and Ontario.—0.0.

In addition to the preceding the following notes are at hand:

Hermann, Mo., heavy floating ice in Missouri River 3d.

Muscatine, Iowa, Mississippi River frozen over on 5th; ice moved out 17th.

Lake Oneida, N. Y., was frozen over December 16, which is considered quite early in the season for this lake to freeze.

METEOROLOGY AND MAGNETISM.

By Prof. FRANK H. BIGELOW.

For a description of the method of constructing the tables and curves of Chart V, see the WEATHER REVIEW for October, 1895, page 371. The numbers in the columns H, D, V, of Chart V, are added, respectively, to the mean values of the forces for Washington and Toronto, i. e., H = 0.18250; D = 175.0; V = 0.58400.

In the case of V it was necessary to multiply the residuals for Washington by 2 and those for Toronto by ½ in order to reduce them to about the same amplitude, as the sensitiveness of the instruments of these two stations was very different during December, 1895.

CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division.

The following extracts in regard to the general weather conditions in the several States and Territories are taken from the monthly reports of the respective services.

Snowfall and rainfall are expressed in inches.

Alabama.—The most noteworthy characteristics of the month were generally clear to partly cloudy weather and some little deficiency in warmth and moisture, as compared with the normal. The mean temperature was 45.4°, or 1.2° less than normal. The highest was 86°, at Citronelle on the 1st; the lowest, 8°, at Scottsboro on the 6th. The average precipitation was 3.59, or 0.63 less than normal. The greatest monthly was 6.81, at Newbury and Union; the least, 1.00, at Claiborne.

Arizona.—The mean temperature was 44.0°, or 9.0° below normal. The highest was 85°, at Tucson University on the 4th and Buckeye on the 10th; the lowest, 7° below zero, at Flagstaff on the 19th. The average precipitation was 0.38, or 0.02 above normal. The greatest monthly was 1.52, at Pinal Ranch, and the least, "trace," at Signal.

Arkansas.—The mean temperature was 43.7°, or 1.8° below normal. The highest was 78°, at Elon on the 18th and 19th and at Texarkana on the 21st; the lowest, 5°, at Silver Springs on the 3d. The average precipitation was 3.96, or 0.38 below normal. The greatest monthly was 10.04, at Winslow, and the least, 1.31, at Russellville. Snow fell in all portions of the State, ranging from a "trace" in the extreme south to 5.00 at some stations in the central portion.

California.—The mean temperature was 52.9°, or 6.8° below normal. The highest was 110°, on the 12th, at Galton in the desert regions of Riverside County. The lowest, 19° below zero, at Adin on the 22d and at Bodie on the 29th. The average precipitation was 1.95, or 2.47 below normal. The greatest monthly was 11.20, at Bowmans Dam; the lowest was 0.00, at Barstow, McMullen, and Needles.

Colorado.—The month was unusually cold on the western Slope. The deficiency ranged between 4° and 9° daily. East of the Continental Divide the temperature was about normal over Larimer and Boulder counties, and 2° below the average over western Arapahoe, Bent, and Sedgwick counties. In other sections on the eastern Slope the month was from 1° to 6° colder than usual. The highest temperature recorded was 73°, at Smoky Hill on the 12th and at Minneapolis on the 13th. The lowest, 35° below zero, at Gunnison on the 18th and 28th. The average precipitation was 0.64, or about one-half the usual amount. The greatest monthly was 4.50, at Climax. Several stations reported no rain or snow.

Florida.—Severe frosts occurred over the northern and north-central portions of the State, and less severe ones as far south as Eau Gallie and Melbourne. The mean temperature was 54.7°, or 7.3° below the normal. The highest temperature was 86°, at Lemon City on the 1st, and the lowest, 22°, at Archer on the 6th. The average precipitation was 1.63, or about one and a quarter inches below normal. The greatest monthly was 6.27, at Jupiter, and the least, 0.43, at Kissimmee.

Georgia.—The mean temperature was 46.5°, or about 1° less than normal. The highest, 80°, was recorded at Morgan on the 7th, and the lowest, 9°, at Diamond on the 31st. The average precipitation was 3.14, or 1.10 less than normal. The greatest monthly was 5.71, at Diamond, and the least, 0.93, at Brag. Snow fell on several days in the northern counties, but was very light, except in the mountain districts.

Idaho.—The mean temperature was 23.9°, or 1.3° below normal. The highest was 60°, at Fraser on the 5th and Lewiston on the 12th; the lowest, 23° below zero, at Chesterfield on the 30th. The average precipitation was 2.05, or 0.16 above normal. The greatest monthly amount was 5.06, at Fort Sherman, and the least, 0.20, at Downey and Oakley. High winds were of frequent occurrence during the latter part of the month.

Illinois.—The mean temperature was 2.8° above normal. The highest was 70° at Mount Vernon on the 24th, and the lowest, 8° below zero, at Ashton on the 3d and 5th, Chemung on the 3d, and Oswego on the 5th. The precipitation averaged more than 2.25 above normal. The greatest was 8.08, at Springfield, and the least, 1.41, at Lanark. It is especially noteworthy that the heavy rain came with a thaw which took the frost from the ground and permitted the rain to be absorbed, thus preventing damaging overflows and wetting the soil thoroughly.

Indiana.—The mean temperature was 34.1°, or 0.9° above normal. The highest was 69°, at Ashboro on the 20th, and the lowest, 2°, at LaFayette on the 3d and Gunman on the 31st. The average precipitation was 4.50, or 1.58 above normal. The greatest occurred in the northern portion of the State, and the least in the southern. The greatest monthly was 8.25, at South Bend, and the least, 2.80, at Bedford.

Iowa.—The mean temperature was 25.2°, or 1.7° above normal. The highest was 63°, at Keokuk on the 17th, and the lowest, 16° below zero, at Rock Rapids on the 2d. The average precipitaton was 1.63, or normal. Its distribution was very unequal; most of it fell in the southeast and east districts. The largest amount was 5.74, at Fort Madison; the least, 0.00, at Estherville.

Kansas.—The mean temperature was 33.4°, or 1.5° below the normal. The highest was 75°, at Meade on the 13th, and the lowest, 7° below zero, at Coolidge on the 20th. The average precipitation was 1.78, or 0.61 above normal. The greatest monthly was 12.45, at Oswego, and the least, "trace," at Macksville and Phillipsburg. The storms of the 16th to the 24th caused great floods and much damage in the southeastern counties.

Kentucky.—The mean temperature was 38.8°, or very near normal. The highest was 77°, at Paducah on the 24th, and the lowest, 6°, at Princeton on the 4th. The average precipitation was 4.43, or about 0.75 above normal. The greatest monthly total was 6.68, at Russellville, and the least, 2.55, at Sandy Hook.

Louisiana.—The mean temperature was 51.3°, or 2.9° below normal. The highest was 81° at Schriever on the 1st, and the lowest, 18°, at the North Louisiana Experiment Station (Calhoun) on the 30th. The average precipitation was 4.48, or 0.77 above normal. The greatest monthly was 7.14 at Amite, and the least, 1.87, at Shreveport.

Maryland.—The mean temperature was 37.6°, or 2.1° above normal. The highest was 70°, at Pocomoke City on the 21st, and the lowest, 7°, below zero, at Deer Park on the 4th. The average precipitation was 2.49, or 0.45 below normal; the greatest was 3.75, which occurred at Western Maryland College, Westminster, and the least, 1.50, at Deer Park. Seventeen inches of snow fell during the month at Oakland.

Michigan.—The mean temperature was 27.5°, or 0.3° above normal. The highest was 63°, at Birmingham on the 25th and Adrian on the 26th; the lowest, 18° below zero, at Flint on the 13th. The average precipitation was 4.89°, or 2.38° above normal. The average total precipitation was the greatest of which this bureau has record during any December. The continuous 10-day rain from the 16th to the 26th is also unprecedented in the December records of the State. The greatest monthly precipitation, 10.56, occurred at Benton Harbor, and the least, 1.20, at Harbor Springs.

Minnesota.—The mean temperature was 18.3°, or 0.9° above normal. The highest was 51°, at Winona and Minnesota City on the 17th, and the lowest, 27°, below zero, at Pokegama Falls on the 30th. The average precipitation was 0.28, or 0.63 below the normal. The greatest was 1.55, at Winona, the lowest, 0.00, at St. Cloud.

Mississippi.—The mean temperature was 47.3°, or 0.2° below normal. The highest was 81°, at Vaiden on the 23d, and the lowest, 10°, at Duck Hill on the 5th. The average precipitation was 5.08, or 0.05 below normal. The largest monthly was 7.34, at Brookhaven and Vaiden, and the smallest, 2.37, at Austin. The rainfall was very well distributed over the entire State.

Missouri.—The mean temperature was 34.3°, or 0.4° above normal. The highest was 69°, at Appleton City on the 17th, and the lowest, 8°, below zero, at McCune Station on the 3d. The average precipitation was 6.19°, or 4.19° above normal. The greatest monthly total, 13.67, occurred at Phillipsburg, and the least, 1.28, at Marryville. In the southwest, central, and northeast portions of the State the greater part of the rainfall of the month fell during the storm which prevailed from the 17th to the 20th. At Phillipsburg, Laclede County, the total fall during this storm was 12.20, 6.95 falling between 5 p. m. of the 17th and 5 p. m. of the 18th. At Lebanon, in the same county, the total precipitation for the storm was 10.50; at Springfield, Mount Vernon, Lawrence County, and Fulton, Callaway County, it exceeded 9 inches and over the greater part of the central and southwest sections, and a considerable portion of the northeast section, it exceeded 6 inches. This phenomenally heavy rainfall caused destructive floods in the Osage, Sack, Spring, Gasconade, Meramec and Cuivre rivers and their tributaries, and other streams in the southwest, central, and east-central portions of the State. The Osage River is reported to have been the highest since 1844, and the floods were the worst ever known to have occurred at this season of the year. Bridges and culverts were washed out; many buildings were submerged, their contents destroyed, and a large number of families rendered destitute.

Montana.—The mean temperature was 27.0°, or about 2.0° below normal. The highest was 70°, at Poplar on the 10th, and the lowest, 29° below zero, at Glasgow on the 2d. The average precipitation was 0.79, or about 0.06 above normal. The greatest monthly was 2.78, at Libby, and the least, 0.02, at Sun River. The month was remarkable for high winds over the entire State; an iron bridge spanning the Yellowstone River 4 miles south of Livingston was wrecked by them on the night of the 27th.

Nebraska.—The mean temperature was 28.1°, or 2.5° above normal. The highest was 68° at Benkleman on the 9th, and the lowest, 12° below zero, at Hay Springs on the 2d. The average precipitation was 0.15, or 0.54 below normal. The largest was 1.34, at Rulo; at several stations there was neither rain nor snow.

Nevada.—The mean temperature was 28.0°, or 1.7° below normal.

The highest was 78° at Hamilton on the 11th, and the lowest, 34° below zero, at Stofiel on the 18th. The average precipitation was 0.42, or 1.26 below normal. It was extremely light all over the State. The deficiency amounted to 4.12 at Tuscarora, and the only excess was at Wadsworth. The greatest monthly was 3.07, at Lewers Ranch, and the least, 0.00, at Las Vegas and St. Thomas.

New England.—The mean temperature was 31.5°, or 3.2° above normal. The highest, 71°, at Norwalk on the 26th, and the lowest, 20° below zero, at Berlin Mills and Enosburg on the 13th. The average precipitation was 3.12, or 0.44 below the normal. The greatest monthly amount was 6.88 at North Conway, and the least, 1.40, at New London. The ground was not well covered with snow during the month and it is feared the frequent thawing and freezing of the surface of the ground has injured grass and grain roots. The want of snow has been severely felt in the lumber districts.

New Jersey.—The mean temperature was 37.2°, or 4.7° above normal. The highest was 76°, at Moorestown on the 20th, and the lowest, 3°, at Deckertown and Newton on the 13th. The average precipitation was 2.61, or 1.01 below normal. The greatest monthly was 5.42, at Englewood, and the least, 1.71, at Barnegat.

New Mexico.—The average temperature during the month was decidedly below normal, and, with one exception, was the coldest December since the establishment of the station at Santa Fe, in 1871. The highest temperature was 73°, at Eddy on the 14th and Roswell on the 16th, and the lowest, 23° below zero, at Ranches of Taos, on the 30th. The average precipitation was considerably above normal and was fairly well distributed over the Territory. The greatest total was 2.90, at Chama. Aztec, Engle, and Olio reported only a "trace" and San Marcial, 0.00.

New York.—The mean temperature was 3.1° above normal. The highest temperature was 69°, at Victor on the 20th, and the lowest, 18° below zero, at Saranac Lake on the 15th. The average precipitation was 3.70, and was generally above the normal. The greatest monthly was 6.31, at Canton, and the least, 1.68, at Middletown.

North Carolina.—The mean temperature was 42.4°, or 0.3° below normal. The highest was 76°, at Newbern, on the 2d, and the lowest, 5°, at Linville and Waynesville on the 6th. The average precipitation was 3.4, or 0.59 below normal. The greatest amount was 8.49, at Linville, and the least, 1.03, at Rutherfordton.

North Dakota.—The mean temperature was 13.8°, or 0.2° above normal. The highest was 62°, at Berthold Agency, on the 27th, and the lowest, 32° below zero, at Steele on the 1st. The average precipitation was 0.29, or 0.61 below normal. The greatest amount was 0.88, at White Earth, and the least, 0.03, at Willow City.

Ohio.—The mean temperature was 33.9°, or 1.2° above the normal. The highest was 79°, at Coalton on the 20th, and the lowest, 13° below zero, at Warsaw on the 13th. The average precipitation was 3.85, or 1.25 above the normal. The greatest was 6.72, at Wauseon, and the least, 1.65, at Thurman. Precipitation occurred at various points in the State on every day of the month, and, in the main, was very well distributed.

Oklahoma.—The mean temperature was 39.4°, or 0.9° below normal. The highest was 86°, at Hennessey on the 6th, and the lowest, 8° below zero, at Hennessey on the 20th. The average precipitation was 4.14, or 1.69 above normal. The greatest monthly total was 12.70, at Vinita, and the least, 0.65, at Alva.

Oregon.—The mean temperature was 38.8°, or 0.1° above normal. The highest was 68°, at Langlois on the 11th, and the lowest, 17° below zero, at Lorella on the 29th. The average precipitation was 10.62, or 4.34 above normal. The greatest monthly was 25.10, at Nehalem, and the least, 0.59, at Dayville. The precipitation exceeded all previous records for this month, the amount being almost 1.00 more than the next rainiest December, which was that of 1891, with an average of 9.72. The number of rainy days was unusually large. The station at Government Camp, on Mount Hood, reported a total fall of snow during the month of 130 inches.

The observer at Tillamook, Tillamook County, reports as follows:

Friday, December 13, there was an unusual electric display in this vicinity. There were several vivid displays of sheet lightning across the heavens, seeming to permeate all space with flashes of fire, accompanied with tremendous crashes of thunder. Several trees and houses were struck, though no serious damage was done. The public school building was struck, and the balls of fire rolled around promiscuously in every room. The same phenomena was noticed in several dwelling-houses, and several cases of electrical burnings are reported. Lightning came into the telegraph office, but did little damage there. Nothing like it was ever seen before, so all say, and it seems the whole locality was pervaded with the peculiar electrical demonstration. The storm was followed by a very low barometer.

Pennsylvania.—The mean temperature was 34.2°, or 1.5° above normal. The highest was 70°, at Shinglehouse on the 21st, and the lowest, 10° below zero, at Hollidaysburg on the 14th. The average precipitation was 3.22, or 0.05 below the normal. The greatest monthly amount was 6.55 at Wellsboro, and the least, 1.40, at Doylestown.

South Carolina.—The mean temperature was 46.1°, or 2.2° below normal. The highest was 80°, at Slaws Forks on the 25th, and the lowest, 13°, at Gillisonville on the 6th and at Central on the 13th. The average precipitation was 3.04, or 0.19 below normal. The greatest monthly amount was, 6.55, at Holland, and the least, 1.25, at Central.

South Dakota.—The mean temperature was 22.7°, or about 2.0° above normal. The highest was 69°, at Fort Meade on the 12th, and the lowest, 25° below zero, at Webster on the 2d. The average precipitation was 0.17, or about 0.46 below the average. The greatest monthly amount reported was 1.43, at Webster, and the least, a "trace," at several stations. The month, as a whole, was an unusually pleasant one.

Tennessee.—The mean temperature, 41.3, was normal. The highest was 78°, at Waynsboro on the 15th and 23d, and the lowest, 2°, at Rugby on the 6th. The average precipitation was 4.20, or about 0.25 above normal. The greatest monthly was 7.35, at Tullahoma, and the least, 1.59, at Bristol.

Texas.—The average temperature for the State was 3.1° below normal. It was generally deficient, except in the northeastern portion of southwestern Texas, where the excess amounted to 1.0°. The precipitation averaged, for the State, 0.43 below normal. There was an excess of from 0.11 to 2.07 along the east coast, which extended less than 25 miles inland, and an excess north of the thirty-first parallel of latitude, east of the one hundredth meridian, of from 0.06 to 2.01. Over other portions of the State there was a general deficiency, greatest over southwestern Texas and the southern portions of central Texas, where less than 40 per cent of the normal amount occurred. The greatest local monthly amount was 6.10, at Marshall, and the least 0.00, at Fort Ringgold.

Utah.—The mean temperature was 21.0°, or about 7.0° below normal. The highest was 64°, at St. Georges on the 12th, and the lowest, 24° below zero, at Fort Du Chesne, on the 18th. The average precipitation was 0.78. The greatest monthly rainfall was 1.70, at Heber and the least, "trace," at Cisco, Giles, and Grover. The snowfall averaged 9 inches.

Virginia.—The mean temperature, 39.0°, does not show any marked departure from the normal. The highest, 76°, occurred at Ashland on the 24th and 25th, and the lowest, 1° below zero, at Dale Enterprise on the 14th. The average precipitation was 2.89. There was no great departure from the normal, except at Alexandria. It was generally uniformly distributed over all sections. The greatest monthly amount was 6.29, at Cape Henry, and the least, 0.58, at Alexandria. Snow fell in all sections, but most frequently and heaviest in the western counties.

Washington.—The mean temperature was 37.4°, or 0.6° below normal. The highest was 66°, at Connell on the 14th, and the lowest, 8° below zero, at Ellensburg and Moxee on the 22d. The average precipitation was 9.00, or 2.86 above normal. The greatest rainfall for the month, 28.14, occurred at Monte Cristo, and the least, 0.42, at Moxee. This was one of the stormiest months on record. Rainstorms occurred almost daily, and severe windstorms followed each other in rapid and constant succession, but none were so severe as those of December 5–12, 1894. At many stations there were only two or three days on which there was no rain. Snow to the depth of 198 inches fell at Monte Cristo and 165 inches at Cascade. The extraordinary depth of snow caused extensive blockades in the mountains.

West Virginia.—The mean temperature was 36.8°, or very nearly normal. The highest was 72°, at Bluefield and Hewett on the 25th, and the lowest, 6° below zero, at Bloomery on the 14th. The average precipitation was 2.91, or about normal, and was quite evenly distributed. The greatest monthly total, 4.14, occurred at Marlinton, and the least, 1.85, at Morgantown. Greatest depth of snowfall 9.6 at Marlinton.

Wisconsin.—The mean temperature was 25.1°, or 3.1° above normal. The highest was 60°, at Antigo on the 21st, and the lowest, 26° below zero, at Butternut on the 30th. The average precipitation was 0.54, or 0.38 below normal. The greatest monthly was 3.44, at Sharon, and the least, 0.16, at Osceolo Mills. The average snowfall was 4.4 inches. The greatest amount was 15.5 inches, at Butternut.

Wyoming.—The mean temperature was 23.0°, or slightly below normal. The highest was 70°, at Embar on the 12th, and the lowest, 16° below zero, at Sheridan on the 2d, and Laramie on the 29th. The average total precipitation was 0.45, or about normal. The greatest monthly was 2.10 at Sundance, and the least, 0.00, at Lander and Fort Washakie.

SPECIAL CONTRIBUTIONS.

THOMAS JEFFERSON AS METEOROLOGIST.

By FRED. J. RANDOLPH and FRED. L. FRANCIS, of the Weather Bureau.

The following items are extracted from notes furnished to the Editor by the gentlemen above-named. Further interesting remarks on this subject will be found in articles by Mr. Alexander McAdie, published in the Popular Science Monthly, Vol. XLV, p. 331, and in Weather Bureau Bulletin No. 11.

Monticello (in Italian "Little Mountain"), the home of

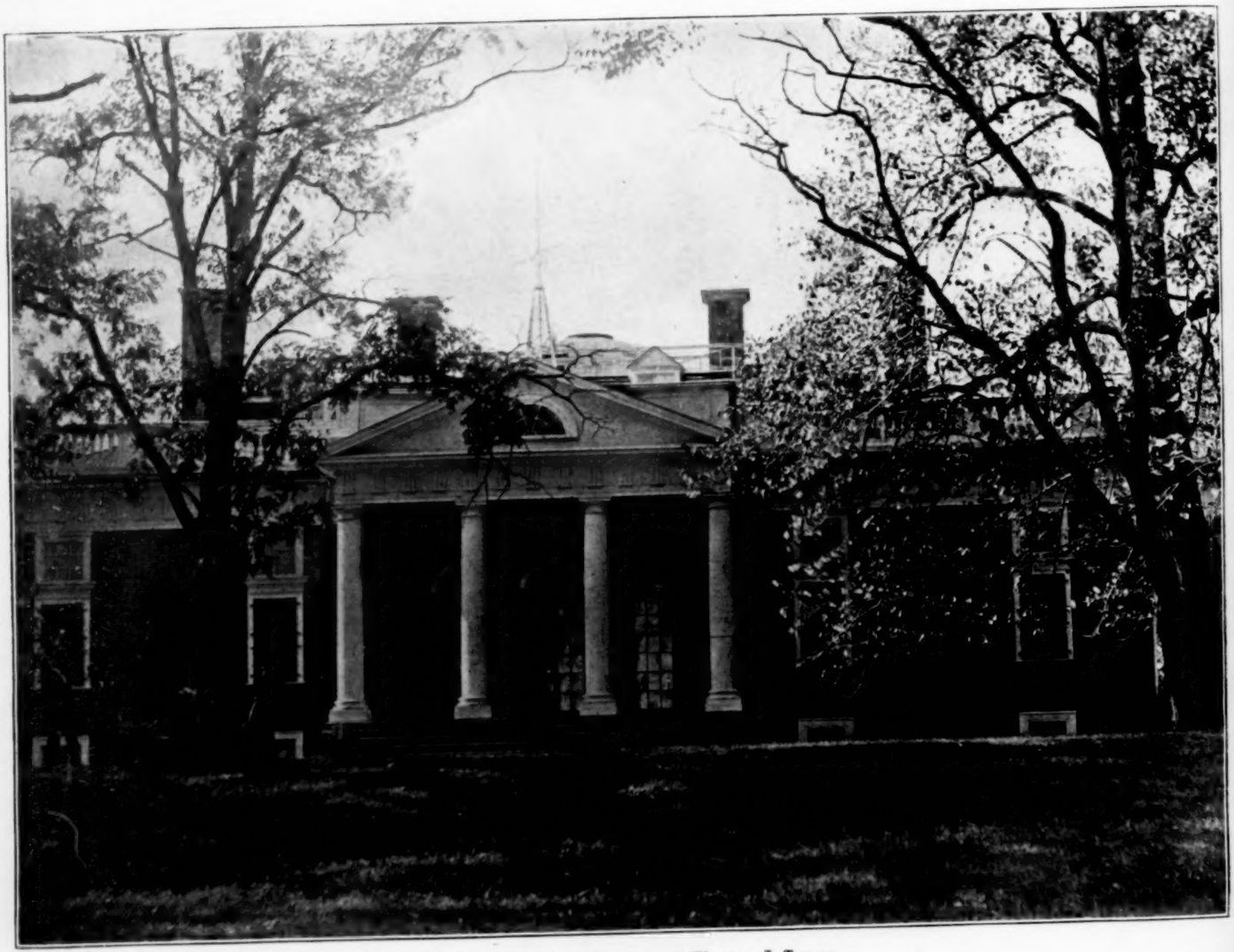

FIG. 1.—Monticello, the home of Thomas Jefferson.

Thomas Jefferson, is on the summit of Monticello Mountain, on the south side of the Ravenna River in Albemarle County, and three miles southeast of Charlottesville, Va. This mountain, which towers up more than five hundred feet above the general level, commands a magnificent view of all the country to the north and east. The birthplace of Thomas Jefferson, called Shadwell, named after the parish in London, where his mother was born, is a couple of miles away.

The accompanying illustration (Fig. 1) shows the front of the Monticello mansion facing east. The general appearance of the building has undergone no alteration or change since Mr. Jefferson's death. The central portion consists of two stories with a dome surmounting the center; the wings are of one story and attic.

Mr. Jefferson was one of the pioneer meteorologists of this country. He kept daily records of the temperature and other important weather conditions during the greater part of his life; he induced others in different parts of the country to make records simultaneously with his own observations; he collected and charted the results, and drew from them his own conclusions with regard to the character and movement of storms, etc. These conclusions were remarkably accurate considering the meager data at his command for such investigations. The photograph of Monticello shows on the roof a part of his instrumental equipment, viz, the wind-vane, the construction of which is very similar to the modern vane. The vertical rod supporting the vane projects down to the ceiling of the portico, to the lower end of which is attached an arrow that indicates by its position on a lettered dial the direction of the wind at any moment, and this can be seen from within the house. Mr. Jefferson made and recorded his weather observations several times each day, and these were not neglected even during the performance of his most important and engrossing public duties. In Paris, during a time when his right arm was disabled, in consequence of a fall, his weather records were made with his left hand. Even during the exciting debate in Congress on the document which he had written, one of the noblest in the annals of the world—the Declaration of Independence—when he was writhing under the bitter criticisms with which it was attacked in some of its parts, his observations of temperature were continued. The record in his pocket memorandum book contains the following entries:

Philadelphia, 1776.

	H.	Min.	°
July 1	9	0 a. m.	81½
	7	0 p. m.	82
2	6	0 a. m.	78
	9	40 a. m.	78
	9	0 p. m.	74
3	5	30 a. m.	71½
	1	30 p. m.	76
	8	10 p. m.	74
4	6	0 a. m.	68
	9	0 a. m.	72½
	1	0 p. m.	76
	9	0 p. m.	73½

For his temperature readings Mr. Jefferson used a pocket thermometer.

In addition to the above the Editor would call attention to the fact that it is not merely as an observer, but also as a careful investigator and as one who fully appreciated many questions in meteorology that Jefferson is especially entitled to be mentioned in this MONTHLY WEATHER REVIEW. His Notes on Virginia, written in 1781–'82 in response to queries by Volney (printed first in Paris in English, 1784, and afterwards in French, 1786; first edition in America published in 1787, second edition, Philadelphia, 1794, third edition, 1825), gives many evidences of his ability as a climatologist and natural philosopher. His investigations into the theory of the motions of the atmosphere are explained in a letter written by him in Paris, November 13, 1786. (See The Writings of Thomas Jefferson, published by the order of the Joint Committee of Congress, with explanatory notes by the editor, H. A. Washington, pages 54–60, Vol. II, 1853.) In his Notes on Virginia (page 109 of the edition of Philadelphia, 1825, or page 324 of the reprint in Vol. VIII of The Writings of Thomas Jefferson) he describes certain descending masses of air such as have been the subject of extensive investigation in connection with fœhn phenomena. Speaking of his own experience in the neighborhood of Monticello he says:

> Going out into the open air, in the temperate and warm months of the year, we often meet with bodies of warm air, which passing by us in two or three seconds, do not afford time to the most sensible thermometer to seize their temperature. Judging from my feelings only, I think they approach the ordinary heat of the human body. Some of them perhaps go a little beyond it. They are of about 20 or 30 feet diameter horizontally. Of their height we have no experience, but probably they are globular volumes wafted or rolled along with the wind. But whence taken, where found, or how generated? They are not to be ascribed to volcanoes because we have none. They do not happen in the winter when the farmers kindle large fires which traverse whole counties, consuming the leaves which have fallen from the trees. And they are too frequent and general to be ascribed to accidental fires. I am persuaded their cause must be sought for in the atmosphere itself, to aid us in which I know but of these constant circumstances, a dry air, a temperature as warm at least as that of the spring or autumn, and a moderate current of wind. They are most frequent about sunset, rare in the middle parts of the day, and I do not recollect having ever met with them in the morning.

In the following paragraph Jefferson alludes to the contemporary observations made at Monticello and Williamsburg, Va., some account of which has been given by Mr. McAdie:

It seems that Jefferson's cousin, Prof. James Madison, of William and Mary College, Williamsburg, Va. (afterwards Bishop Madison), had begun a systematic record of the barometer, thermometer, wind, and rain, and Jefferson, in 1772, began a similar record at Monticello. The comparison of these records seems to have suggested the system of observation explained in the following extract from the letter dated January, 1797, addressed to Mr. Volney, and published at page 341 of Vol. III of T. J. Randolph's Memoir, Correspondence, etc:

> I am sorry that you have received so little information on the subject of our winds. I had once (before our Revolutionary war) a project on the same subject. As I had then an extensive acquaintance over this State I meant to have engaged some person in every county of it, giving them each a thermometer, to observe that and the winds twice a day for one year, to wit, at sunrise and at 4 p. m. (the coldest and the warmest point of the twenty-four hours) and to communicate their observations to me at the end of the year. I should then have selected the days in which it appeared that the winds blew to a center within the State, and have made a map of them, and seen how far they had analogy with the temperature of the air. I meant this to be merely a specimen to be communicated to the Philosophical Society at Philadelphia, in order to engage them, by means of their correspondents to have the same thing done in every State, and through a series of years. By seizing the days when the winds centered in any part of the United States we might, in time, have come at some of the causes which determine the direction of the winds, which I suspect to be very various. But this long-winded project was prevented by the war which came upon us, and since that I have been far otherwise engaged.

During the past few years there have been several references in the WEATHER REVIEW to the subject of "frostless zones." It is a matter of course that observant farmers in dry climates, such as that of the United States, must always have been familiar with the phenomenon that the meteorologist calls the "inversion of temperature," occurring on still clear nights, but it is interesting to find that Jefferson is the first American author who refers to the subject as in the following extract taken from his Notes on the State of Virginia (see the Philadelphia edition of 1825, page 112):

> The access of frost in autumn and its recess in the spring do not seem to depend merely on the degree of cold, much less on the air being at the freezing point. White frosts are frequent when the thermometer is at 47°, have killed young plants of Indian corn at 48°, and have been known at 54°. Black frost, and even ice, have been produced at 38½°,

which is 64° above the freezing point. That other circumstances must be combined with the cold to produce frost, is evident from this also; on the higher parts of mountains, where it is absolutely colder than in the plains on which they stand, frosts do not appear so early by a considerable space of time in autumn and go off sooner in the spring than in the plains. I have known frosts so severe as to kill the hickory trees round about Monticello, and yet not injure the tender fruit blossoms then in bloom on the top and higher parts of the mountain, and in the course of forty years, during which it has been settled, there have been but two instances of a general loss of fruit on it, while in the circumjacent country the fruit has escaped but twice in the last seven years. The plants of tobacco, which grow from the roots of those which have been cut off in the summer, are frequently green here at Christmas. This privilege against the frost is undoubtedly combined with the want of dew on the mountains. That the dew is very rare on their higher parts, I may say with certainty from twelve years observations having scarcely ever, during that time, seen an unequivocal proof of its existence on them at all during summer. Severe frosts in the depth of winter prove that the region of dews extends higher in that season than the tops of the mountains, but certainly, in the summer season, the vapors by the time they attain that height are become so attenuated as not to subside, and form a dew when the sun retires.

One more extract from the Notes on the State of Virginia showing Jefferson's close observation of the optical phenomenon known as "looming," which is frequent at sea but rare on land; but as Jefferson says:

At Monticello it is familiar. There is a solitary mountain about 40 miles off in the south, whose natural shape, as presented to view there, is a regular cone, but by the effect of looming it sometimes subsides almost totally in the horizon, sometimes it rises more acute and more elevated, sometimes it is hemispherical, and sometimes its sides are perpendicular, its top flat and as broad as its base. In short, it assumes at times the most whimsical shapes, and all these perhaps successively in the same morning. The Blue Ridge of mountains comes into view in the northeast at about 100 miles distance, and approaching in a direct line passes by within 20 miles and goes off to the southwest. This phenomenon begins to show itself on these mountains at about 50 miles distance and continues beyond that as far as they are seen. I remark no particular state, either in the weight, moisture, or heat of the atmosphere, necessary to produce this. The only constant circumstances are its appearance in the morning only, and on objects at least 40 or 50 miles distant. In this latter circumstance, if not in both, it differs from the looming on the water. Refraction will not account for the metamorphosis. That only changes the proportions of the length and breadth, base and altitude, preserving the general outlines. Thus, it may make a circle appear elliptical, raise or depress a cone, but by none of its laws, as yet developed, will it make a circle appear a square, or a cone a sphere.

NOTES BY THE EDITOR.

METEOROLOGY IN THE PUBLIC SCHOOLS.

Among the improvements in methods of education none is more rational and practically successful than that which insists on requiring the pupils, from the youngest to the oldest, to observe natural phenomena and make their own personal records and deductions. For a century past the favorite field of "nature-study" has been that of botany, and a visitor to the best primary schools will find the children bringing in quantities of leaves, buds, and flowers, which they compare and study, and thus quicken their habits of observation and generalization. Almost equally attractive is the elementary study of the soils, rocks, and minerals. In regions where birds and insects are accessible these also afford fine objects for study. The whole tendency of modern pedagogy is to stimulate the study of nature in every field, especially those most easily accessible. In October, 1882, the present Editor had occasion to give a series of talks to the students of the Normal School in Washington, and to maintain that as we have the weather about us every day it constitutes an admirable subject for youthful observation and study. In accordance with the principles that were then taught at that Normal School it was necessary for each member of the class to record and analyze her own observations on the subject under consideration, in order, by this personal training, to obtain the experience that is necessary to successfully conduct the classes of children that must eventually come under her care. Accordingly, the present writer prepared an elementary printed form for the use of the class in which each member kept a personal diary of the weather, in so far as that could be done without instruments. Specimens of these diaries and an explanation of the whole system were exhibited at the New Orleans Exposition in December, 1884, in the division of pedagogy.

Subsequently the accomplished principal and founder of the Normal School at Washington (Miss Lucilla E. Smith) was called to take charge of a part of the work of the Training School for Teachers in Brooklyn, N. Y. In such a location where botany and geology are not so easily studied she again had occasion to advocate the observation and study of atmospheric phenomena as a means of training the perceptive faculties of the pupils. This idea, which was at first so novel, has been practically carried out during the past two years, and many have testified that not only the scholars but the teachers themselves have profited greatly by this drill. Each child is expected to keep a record of the wind and weather, and the discussions that take place are rapidly disabusing the children's minds of erroneous ideas that are widely disseminated. The trite weather sayings that have been current for centuries, and that have no real basis of fact, yet are handed down like myths and legends *viva voce*, from parent to child, are now daily brought to the test of actual experience, and a healthy stimulus is given to the study of nature. The children, and even the teachers, begin to wonder at the numerous erroneous notions formerly entertained and to admire the clearer vision that they are now rapidly attaining. This feature in the study of nature was advocated before the Brooklyn Institute in 1893, and the teaching of meteorology in the schools has since then received enthusiastic endorsement. Probably Miss Smith was the first in this country to introduce this study, first into the Normal School and then into the public schools of all the lower grades. The future development of meteorology in this country will largely depend upon the extent to which it is taught in the public schools. The special meteorologists of future generations will, undoubtedly, look back to the time when, as school children, their attention was first seriously directed to this study.

THE GENERAL CIRCULATION OF THE ATMOSPHERE.

On several occasions the Editor has in the MONTHLY WEATHER REVIEW enforced the principle that the important peculiarities of any season depend upon what is called the general circulation of the earth's atmosphere. That is to say, an unusual drought or a remarkable series of rains, or the so-called apparent secular change in the general climate of any locality is not at all to be considered as dependent, even to the slightest extent, upon the destruction of forests, the cultivation of the surface of the ground, the local evaporation, the presence of lakes or rivers, etc. Even great forest fires have been shown to have little influence on the subsequent weather. All these phenomena affect the air that is temporarily at the surface of the earth, but as soon as this air is raised and carried off into the cloud region, it is mixed with such a large mass of other air that its special influence becomes greatly diminished, and is felt, if at all, in some far distant region and at some distant time. It is very easily shown that the strong winds, and with them the temperature

and dryness that we feel during midday, represent currents of air that are descending to the ground from regions far above us. This descent is due to several distinct causes. Formerly meteorologists spoke of the ascent of air heated by contact with the warm soil upon which the sun was shining, but now we must equally recognize the descent of colder air and its cooling by radiation, which is quite as important as the warming by insolation. Ascending currents may be caused by the action of the sunshine upon the upper surface of clouds, or by the condensation of the moisture and the evolution of heat within the clouds. Descending currents may be caused by the radiation from the surface of the clouds, or even from the dust contained in what is called ordinary clear air. In addition to the vertical interchange due to heat another special mechanism by which upper and lower layers of air are interchanged, is to be found in the fact that the lower horizontal currents by striking against obstacles are forced upward. The obstacle may be either a layer of air, or a gentle ocean shore, or the resistance of a high range of mountains. The obstacles encountered by the winds are quite as important as the influence of temperature and evaporation over land and water. If we consider the earth as a whole we find that over the so-called watery hemisphere the atmosphere near the surface of the ocean experiences resistances to motion, differences of temperature, and variations in moisture that are all far smaller than those experienced over the land that prevails on the continental half of the globe.

The study of the dynamics, that is to say, the theory of the motions of the atmosphere began by solving the simpler problems in which the earth's surface is regarded as a regular sphere having a uniform coefficient of friction or slip, or, perhaps, even no friction or resistance, but we must now proceed to the study of the influence of the larger rugosities of the surface, such as mountain ranges, plateaus, and continents, and that too without neglecting the variations of temperature and moisture.

For the same barometric gradient we find stronger horizontal winds but less vertical interchange over the ocean than over the land. If we draw isobars for the whole globe, we find areas of high and low pressure over the land and water so distributed along any small circle of latitude that we usually say the pressure varies with the seasons, and appears less over the warm regions and greater over the colder regions. If, however, we draw isobars for a surface that is 5,000 meters above sea level, which surface is, therefore, above almost all points of the Rocky Mountain Region and the Andes, and above the greater part of the Himalayas, and if we plot the motions of cirrus clouds in connection with these upper isobars, we are able to study another aspect of the combined influence of the temperature of the air and the resistance to its motion. At this level a single area of low pressure of an ovoidal shape surrounds either pole; the Antarctic area is quite symmetrical about the South Pole, but the Arctic area is by no means so with regard to the North Pole. Both the shape and the want of symmetry of the Arctic area varies from month to month and, of course, more so from day to day. These variations in the upper isobars result partly from broad features in the variable temperature and moisture, cloudiness and rain of the atmosphere below the level of this upper surface, but they depend still more directly upon the resistances which the lower air experiences as it moves over the land and the water, and on the inertia of the moving mass of air and the rotation of the whole atmosphere with the earth. Pressure depends in general not only upon the weight of the atmosphere above any point but upon the motion of the air at that very point itself, since this motion implies the introduction of centrifugal forces which act perpendicularly to the line of movement. It is proper to consider that upper atmosphere of the Northern Hemisphere is tending to move around and inward in accordance with the isobars at this upper level, but that in this movement it experiences resistances which force it to ascend slightly in some regions and to descend in others. When it strikes a coast line or very gentle slope the ascent is decided, but correspondingly gentle; when it strikes an abrupt coast line a portion is forced upward, while an important portion is forced downward and backward. The study of these upper isobars and isotherms and cloud movements brings into one general and homogenous system the phenomena that we observe at the surface of the ground and the most diverse phenomena in distant portions of the globe. Several illustrations of such connections have already been published in the REVIEW, and we have now to refer to a still more interesting case that has lately been worked out by Mr. John Eliot, meteorological reporter to the Government of India. (See Quarterly Journal Royal Meteorological Society, January, 1896, Vol. XXII, p. 1.)

During the years 1894–'95 the Government of India has published a daily weather chart, showing the chief features of the meteorology of southern Asia and the adjacent seas southward over the Indian Ocean to about 10° beyond the equator. The object of this publication has been to furnish the data for the proper study of the relation between the rains and winds of the cold weather season or the northeast monsoon period, as also the winds and rains of the southwest monsoon period or warm weather season. The climate of India has generally been considered as divisible into two seasons, the northeast monsoon in the colder half of the year and the southwest monsoon in the warmer half. Rains or snows of considerable agricultural importance occur during the colder half, but the principal rains are those of the southwest monsoon. The general reason for the well-marked seasonal systems of cold, dry northeast and warm, moist southwest winds has usually been found in the coldness of the air over India and Asia during the winter and its warmth during the summer. For some years past efforts have been made to predict the general character of the monsoon seasons from our knowledge of the conditions that caused it to be hot or cold over India and the countries to the northward. Such predictions were felt to be imperfect because it was evident that the atmosphere to the south of India and, therefore, over the ocean ought to be considered quite as carefully as the conditions to the northward. By widening the area of study, as in the daily charts of the Indian monsoon area, a first step was taken in the proper study of the causes of the two monsoons, but Mr. Eliot has gone farther by adding a comparison of the conditions that simultaneously prevail over Europe, the Mediterranean, Persia, and Abyssinia. Such studies are analogous to those that have been made on a larger scale at the Weather Bureau by means of the great system of international observations and charts published between 1878 and 1887 and which have been kept up in a modified form since then. These charts of the whole Northern Hemisphere force us to take a broad view of the general circulation of the atmosphere and its direct influence on local conditions. The following is an abstract of Mr. Eliot's results:

In India the year may be divided into seasons, as follows: (1) the northeast monsoon, from December to February; (2) the transition, March to May; (3) the southwest monsoon, June to September; (4) the transition, October and November. During the northeast monsoon cold weather storms, with rain or snow, prevail, and, with regard to these, Eliot shows that they almost invariably originate over the plateau of Persia or in Beloochistan, or northwestern India. They travel toward the east or east-southeast at the rate of 15 or 20 miles per hour; they have moderate winds compared with the storms of the southwest monsoon; they bring the moderate rain essential for the cold-weather wheat and other

crops of northern India, and are the chief sources of the snowfall of the western Himalayas; hence their economic importance and the necessity of issuing seasonal forecasts, if possible. If the northeast storms could be traced backward to the Mediterranean Sea and Europe, then the daily weather maps of that region should give the means of predicting the storms of India; but a study of those maps does not show a single case where such connection can be clearly made out. With perhaps one exception the cold-weather storms of 1893 started in the plateau of Iran during the prevalence of strongly-marked and persistent anticyclonic conditions north and west of that region, viz, in southeastern Europe, and it is probable, therefore, that these are the conditions most favorable to their formation. With very rare exceptions the cold-weather storms of India are not the continuation of European storms. It is almost certain that the annual snowfall of the Himalayas north of Cashmere, Punjab, and the northwest provinces is received almost entirely during the northeast monsoon, and that little falls during the southwest monsoon. The winter supply, which at some stations amounts to 50 feet, is almost certainly sufficient for the summer and autumn melting.

During the southwest monsoon season a complete change in winds and pressures takes place over the Indian Ocean, such as has no parallel elsewhere on the globe. The trough or belt of low pressure near the equator disappears; the tropical belt of high pressure north of the equator also disappears; the areas of northeast trades and of equatorial calms also disappear. The southeast trades of the Southern Hemisphere extend northward across and beyond the equator. On their western border, as they turn toward the northeast, they strike Abyssinia and even the coast of Arabia, and thus become the southwest monsoon winds of the Arabian Sea; on their eastern border they flow from Australia parallel to Sumatra, and, turning as they cross the equator, become the southwest monsoons of the Bay of Bengal. There is, therefore, a region, covering at least 30° in latitude and 70° in longitude, over which the motion of the lower atmosphere is completely changed by the transition from winter to summer. On comparing this great area with the much smaller land surface of India, and, indeed, of southern Asia, we see that the heated air of India alone is not likely to be the principal cause of the atmospheric disturbance. Mr. Eliot, after quoting the views of several eminent meteorologists, and after a detailed examination of the maps for each month of the year 1893, shows that the change called the "burst of the monsoon," or the sudden change from dust, dryness, and heat to moisture, coolness, and rain commences first in southern India, and advances northward, as it also advances from the coast districts into the interior. The rate of advance varies from year to year, and is sometimes effected in the course of a few days over the whole of India. In 1893 it occupied about two weeks, between the second and fourth week of June. The hottest period of this year in northern and central India was that from May 15 to May 21, or immediately preceding the burst of the monsoon in southern India. At this time the pressure in northern India was decreasing by a series of oscillatory changes, while the pressure at Zanzibar and over the Gulf of Arabia, was quite steady. During the third and fourth weeks of May, 1893, pressure increased about 0.05 at Zanzibar, and also at the Seychelles; the winds in the equatorial regions strengthened, and, finally, having passed the stage of unstable equilibrium, a strong current advanced northward toward India, with rainy, squally weather at its front. This change was completely effected during June, and then became permanent for the next three months. By June 21 the southwest monsoon was fully established over the Indian land and sea areas. After this the pressure was not so much lower in India, but was decidedly higher in the equatorial and south Indian Ocean. Before the burst of the monsoon the isobars ran parallel to the east and west coasts of southern India, but after that date they ran from east to west, or across the coast lines, and nearly parallel to the lines of latitude. Before the monsoon the isobars were largely the result of thermal conditions in the interior of India, but during the monsoon they were more directly related to the prevalence of the strong, steady, and massive southwest current. This latter distribution of pressure is clearly not the product of the antecedent or the actual thermal conditions in India proper.

By tracing the southwest monsoon back to the equator, and beyond, Mr. Eliot discovered that the flow of the current across the equator in 1893 increased rapidly in strength and steadiness in June and was strongest and steadiest in July; it thence decreased in both respects, rather slowly in August and rapidly in September, becoming weak and unsteady at the commencement of October. The fluctuations in the air current across the equator were related directly to the distribution and amount of the rainfall in India; in general, the rainfall was heaviest and most general when the air currents across the equator were strongest and *vice versa*. Any large variation in one was reproduced in the other. When the current was strongest in the equatorial belt and the Indian Seas and, consequently, while India was receiving its heaviest monsoon rains the weather in the equatorial belt was generally fine and skies were frequently clear for days and squalls were of comparatively rare occurence. There is, therefore, an inverse relation between the rainfall in India and in the equatorial belt, more especially its western half. The steadiness of the winds in the equatorial belt is as great as that of the monsoon flow into India across the coasts of Bombay and Bengal and, probably also as in the Arabian Sea and the Bay of Bengal.

So large a change in a great atmospheric current like that of the southeast trades over the Indian Ocean, by which, instead of ascending at the equator and flowing back as northwest upper trades, they are pushed across the equator and kept in the lower atmosphere until they ascend over Abyssinia and the Himalayas, can only be produced by the prolonged cumulative action of large forces. In 1893 two stages of change were recognized by Eliot, the first was preparatory, during which the ascensional movement over the equatorial belt was diminishing while the outflow toward the north was increasing. During the second stage, in consequence of increasing pressure in the extreme south, the ascensional movement diminished more rapidly and the whole mass of southeast trades was transferred northward by a continuous slow movement.

The western portion of the current across the equatorial belt which is, as a rule, strongest in July supplies aqueous vapor and rain successively to three large areas, namely: (1) the basins of the White and Blue Nile in Africa; (2) Hither India; (3) Birmah or Farther India. It is probable that prolonged, excessive rainfall in one of these areas will diminish the rainfall in the other. It is also probable that any large variations in the rainfall will accompany variations in the monsoon winds, and hence, also of the current across the equator. The monsoons are due to the invasion of India by moist southwest winds from the equatorial belt and not to a special hot weather local circulation of air set up in India by excessive temperature conditions. As the winds crossing the equator in August, 1893, were much more easterly than in June or July it followed that in August a larger proportion of the air was carried toward Abyssinia and the Upper Nile and less toward India. Possibly the weakness of the winds and lightness of the rains in India were due to this defection toward Africa, and, in general, it appears plausible that a diminished rain in India proper may often be the result of a heavier rain in Abyssinia and the sources of the Nile. Mr. Eliot therefore compares the reports of flood level in the Nile,

as given by Mr. Willcock in U. S. Weather Bureau Bulletin No. 11, with the monsoon rainfall in India. The tabular data for this purpose are probably not directly comparable, but the suggested connection is plausible and very important, as we shall thus be able to connect the famines of Egypt and India with the movement of the air over the equatorial regions.

The suddenness with which the southwest monsoon bursts over India may be compared, in many respects, with the advance of those sudden changes of the weather with which we are familiar in America. The blizzards and cold waves of the United States and the pamperos of Brazil advance with well-defined fronts, and effect a complete change in the weather at any place within a few hours. From a mechanical point of view the most interesting feature is the steady increase of pressure in the southern Indian Ocean while the air over India becomes hotter with a relatively slight decrease of pressure. The intervening atmosphere thus passes through a stage of unstable equilibrium, but as soon as the gradient of pressure sets decidedly northward the air begins to move accordingly, and under the steady action of this gradient its motion is accelerated until the pressures are just able to overcome the resistance. When the advance of the southwest monsoon has brought it to the coast of Hindustan a decided increase of resistance is experienced, which holds it back for several days. J. Allan Broun, the founder of the mountain station, Augustia, has graphically described the view of this contest between the monsoon wind and the resisting land. (See Trevandrum Mag. Obs., Vol. I, p. 517, or Baird's Annual, 1876, p. 102.) In a week or so the increase of pressure in the south and the increasing temperature have combined to overcome this resistance, and the southwest wind pours over the Ghats into the interior of the country. The monsoon advances more rapidly over the interior than it formerly did over the ocean because this delay has given opportunity for an increase in the pressure gradients that determine its motion.

Phenomena similar to the bursting of the monsoon may undoubtedly be found developed, but perhaps on a smaller scale in any country where sudden changes from dry to moist weather occur, and Capt. D. Wilson-Barker points out that it is well known under other names in the Soudan and in Australia.

The pamperos of South America and the northers of the United States illustrate the case of large masses of air advancing horizontally against resistances which must be overcome by an accumulation of pressure in the rear. As the motions over land are resisted far more than over the ocean by the irregularities of the surface, and by the topsy-turvy movements during the warmer part of the day, therefore the accumulation of pressure in the rear or in the so-called area of high pressure, must be larger than in the case of the southwest monsoons of India. The southerly burster of eastern Australia seems to offer an analogous case.

From the essay on Southerly Bursters, by Henry A. Hunt of the Sydney observatory, it would appear that these occur most frequently during the warmer half of the year in the Southern Hemisphere, viz., from September to March, the maximum being in December. In all cases these bursters occur between an area of high pressure, south or west of Australia, and a low pressure, usually a deep depression, north or east of Australia. The high pressure is advancing toward the east or northeast, and the low pressure frequently stretches into a long trough or oval. If we compare these conditions in the Southern Hemisphere with those that occur in the northern, we find a mechanical similarity between the southerly winds of the burster and the northerly winds of our cold waves and blizzards. The principal difference is that due to temperature; for whereas our high pressures and northers occur in our winter season, and represent dry cold air flowing toward a warm moist region, the Australian burster occurs in the southern summer and represents cold moist air from the southerly ocean flowing over a continent where the air is dry and hot. In the American norther the surplus density of the northerly winds is due to their own dryness and low temperature, whereas in the Australian burster the surplus density of the southerly winds results from the deficient density of the very hot dry air over that continent. As the Australian continent is of about the same area as the United States, but has its center of figure about ten degrees nearer the equator, therefore, its average summer temperature is higher than ours. As it has no land to the south corresponding to the Dominion of Canada, therefore in its winter season it is colder than the Polar Ocean in its immediate neighborhood, but in its summer season its temperature is very much hotter than that of its Polar Ocean. Hence, Australia has no great winter blizzards, but has its southerly bursters in the summer time. The severity of the southerly or polar winds in Australia is modified very much by local conditions; thus, in western Australia the winds pass over comparatively level country, but in the eastern portion, the province of New South Wales, is traversed by a mountain range that checks the forward motion of the air until the increasing high pressure carries it over. In the basin west of these highlands the plains are highly heated by the sun and the hot surface air acquires a topsy-turvy circulation, until the high pressure on the west has accumulated sufficiently to push the air eastward over the coast range, which it accomplishes suddenly, while at the same time the southerly winds on the coast rushing inward produce the local gale at Sydney, known as a brickfielder or southerly burster. On the whole the burster is unfavorable to rain; it may bring a few showers to the coast but dry weather prevails in the western part of Australia. A well-developed area of high pressure, such as gives a typical southerly burster, lasting three days, has an axis extending 2,400 miles north and south, and it travels at the rate of 400 miles per day. Steady breezes attend it during the six days required by it to travel from west to east over the lowlands of Australia.

The areas of high pressure that bring bursters to Australia are but special single areas out of hundreds that pursue similar courses over the Antarctic Ocean, but do not happen to approach Australia. Their development and progress constitute integral parts of the so-called general circulation. Special features in the phenomena of bursters are due to local Australian conditions, but the general character of the high areas and the resulting general features of the bursters must be studied not in Australia, but over the distant oceans.

THE PRESENT CONDITION AND RECENT PROGRESS OF CLIMATOLOGY.

By Prof. Dr. W. KOEPPEN. (Extract from Geographische Zeitschrift, Vol. I, p. 617, etc.)

"In America there exists a well-organized system of observations. Notwithstanding this the study of the climatology of this continent is still beset with many difficulties. The extensive system of the U. S. Signal Service that is supplied with money to an extent entirely unknown for such purposes in Europe was originally so trimmed down to the needs of weather telegraphy and weather predictions that there was remarkably little left for climatology or even for science in general. Generals Hazen and Greely, the successors of General Myer, on the other hand, brought about a change by the introduction of scientific investigations, which, after 1891, found a wider official recognition in the transfer of this branch of the public service from military hands over to the Department of Agriculture. Even now, however, practical applications play the leading part in the programme of the new Weather Bureau, but among these the establishment of the climatic elements takes a prominent place. The treasures of observations and self-registers that have accumulated in a

quarter of a century are now made accessible to scientific students more and more freely by a series of important publications and especial care is taken for the rapid and full publication of the data in monthly and annual publications. These publications, especially the MONTHLY WEATHER REVIEW, are now much richer in detail than before and have, indeed, become an authority of the first rank that is, as yet, but little used."

Of meteorology Koeppen says, page 619:

The investigation of the upper strata of air, which has been prosecuted in the last decennium more than ever before, has excited lively interest. Perhaps, in so far as this study has been prosecuted in the free atmosphere rather than at mountain stations, we ought to reckon it as climatology; but if climatology is not to confine itself to the simple facts that can be observed at the earth's surface, but is to take cognizance of their interrelations, it is impossible to ignore what is going on above our heads. It is evident that the air which surrounds us is greatly influenced by whatever goes on within the atmosphere at a short distance. We must not forget that within from 2 to 10 kilometers above us we find entirely different conditions as to temperature, moisture, wind, and pressure, and that from these altitudes there descend upon the earth's surface masses of air that are sometimes very large, at other times very small.

Already, between 1870 and 1880, many high stations, with meteorological observatories, were established in North America and in France. These costly establishments have, unfortunately, advanced science but little, simply because the observations were not published and discussed in a satisfactory manner. The two American stations—located most admirably, Mount Washington and Pikes Peak—were established in 1873, less for the advancement of science than for practical use in weather predictions, although, for want of a scientific knowledge of the upper strata of air, one really did not know how to utilize these observations for predictions. On account of the great expense, especially that of the maintenance of the telegraph lines, these stations are at present abandoned. Pikes Peak, the highest station on the globe (4,300 meters above the sea), ceased observations in 1888, and the daily telegrams ceased in 1882. In order to save its records for the use of science, the observatory of Harvard College published them, in 1889, as Vol. XXII of its Annals. In September, 1892, hourly observations were begun on Pikes Peak and at the base station, Colorado Springs, but, in 1894, these were again closed "for want of money," and that, too, on a mountain that has a steam cog-wheel road to the summit! On the snowy Alps the telephone on the Sonnblick works without failure over the glaciers and at very little expense.

With regard to dynamic meteorology Koeppen says (page 625):

Another important series of ideas that has only recently been introduced into the scientific study of the atmosphere is the application of the theory of wave motions. On the one hand Helmholtz has made it seem probable that progressive waves are formed at the boundary between two currents of air of different velocities superposed upon each other, and that these play an important part in the nonperiodical phenomena, such as the formation of clouds, wind gusts, etc. One example of an atmospheric wave was, in fact, followed many times around the whole earth even before Helmholtz wrote, namely, in the case of the wave attending the outbreak of Krakatoa on the 27th–31st August, 1883. On the other hand from the empirical investigations of Hann and Greely and the mathematical analyses of Lord Kelvin, Margules, and A. D. Schmidt it results that the solution of the riddle of the daily barometric variations will, probably, be found in the formation of stationary waves in the atmosphere in consequence of the diurnal change in temperature. The result of the comprehensive investigation by Hann on this subject consists, especially, in the clear distinction between the daily double variation of pressure depending upon the geographical latitude, almost entirely, and the single variation connected therewith, which latter depends upon the earth's surface and the weather. The discovery of Greely (Lady Franklin Bay Vol. II, p. 169) and A. D. Schmidt (Met. Zeit., 1890, p. 182) consists in this that in the Polar regions the diurnal barometric variation depends not upon the time of the local meridian, but upon a common time evidently that of the region in the interior of Asia having the greatest daily variation. It is thus clear that here we have to do with waves whose causes prevail, not at the place itself, but at a great distance therefrom. Such a diurnal variation which depends upon the time of a distant locality reminds one of the annual variation of the pressure of the air over the oceans of the Southern Hemisphere, which rises and falls simultaneously with the rise and fall of the air pressure over the oceans of the Northern Hemisphere notwithstanding the opposing seasons. The explanation of this lies in the annual transfer or interchange of masses of atmosphere between the Northern and Southern Hemispheres, as I first showed in 1879 (Annalen d. Hydrographie, p. 510, and in the Met. Zeit., p. 417).

"We can not close without mentioning one of the fundamental questions of climatology with which many investigators have busied themselves during the past decade, namely, the questions as to the general circulation of the atmosphere or the wind systems of the globe. During the first sixty years of this century meteorologists necessarily studied the geographical connection of atmospheric processes by means of observations at the individual stations and by the comparison of mean values at different stations. In these sagacious combinations the general system of motions of the earth's atmosphere played an important part. By reason of the new views which the synoptic treatment of simultaneous weather conditions by means of charts and tables allowed, attention was especially called, between 1860 and 1880, to the individual phenomena and the pursuit of their consequences over portions of Europe and America. From these investigations there resulted the important studies on the movements of the atmosphere that were published by the Norwegian professors Guldberg and Mohn, 1876–1880, and which gave the impulse to the applications of hydrodynamics to these motions. Then it was discovered with surprise that already, in 1859, the American meteorologist, Ferrel, had treated of this subject in a brilliant manner and that he had also included the general system of atmospheric circulation between the pole and the equator in the series of his discussions and approximate calculations. Ferrel's theory as to this general circulation is explained with some supplementary details in the excellent treatise on meteorology by Sprung, published in 1885, pp. 192–208. Since that time the question as to the circulation there explained has not been materially advanced so far as meteorology is concerned; but Professor Oberbeck has given another treatment, mathematically more correct, that agrees with Ferrel's results and with experience if we assume that the current which Oberbeck calls the lower current (U) does not reach down to the earth's surface; otherwise Oberbeck's theory is contradictory to both Ferrel and nature.

"The phenomena at the earth's surface itself which Ferrel has taken into consideration are entirely passed over by Oberbeck. The investigations of Max Moeller and Teisserenc de Bort upon these subjects adhere more closely to experience.

"In Germany the question of the general circulation of the atmosphere was first considered outside of the narrow circle of specialists when the renowned physicist and manufacturer, Werner Siemens, in 1886, published an article on this subject in the Sitzungsberichte of the Berlin Academy. This and some further articles that Siemens published on this subject agree with the meteorological facts to a far less extent than Ferrel's work, which latter was also much more completely developed. It is the duty of the present reviewer to state this fact, since those who live at a distance, ordinarily, had much rather follow the leadership of a distinguished foreigner, or outsider, than the less well-known specialist in the respective lines of work, and even inside the ranks of the specialists the influence of so genial a man is very considerable. Thus, Pernter believes that the conclusion of Siemens that even in the higher portions of the atmosphere easterly winds prevail between 35° north and south, finds a support in Oberbeck's calculations. This error undoubtedly arises from an oversight, and in the Met. Zeit. for 1890, the anti-trade is defended with success by Sprung. In the same volume Siemens, in his reply on page 324, then presents the entirely false idea that horizontal differences of temperature give no basis for motions of the atmosphere, but that only an excess of temperature in the lowest strata above the adiabatic distribution of temperature, in the vertical direction, can cause such movements. In reality, even in the cases where the vertical distribution of temperature really responds to unstable equilibrium (which latter is ordinarily caused not by temperature alone, but with

the assistance of other forces arising from the motion of the air and the rotation of the earth) the horizontal differences of pressure arising therefrom are the active forces, as I, among others, have explained in the Austrian Z. O. G. M., 1882, p. 91, where (in the foot-note) I have warned against the too frequent overestimation of the influence of the warming of the air at the base.

"We have thus come to the limit where the geographical element is less important than the physical; where climatology passes over into meteorology. Of course, however, climatology is in the highest degree interested in the progress of meteorology since the connection between its individual isolated facts is in great part to be expected from it. Especially is it true that the explanation of the nature and development of atmospheric whirls or, the regions of high and low pressure, their changes with altitude, their origin and disappearance, will be of the greatest importance for climatology as well as for meteorology. Our knowledge of the movement of whirls has made good progress, but as to their changes in intensity we know nothing except some isolated empirical rules and many vague assumptions. In order to make further advance in this matter we need, above all, a more accurate insight into the distribution of temperature and pressure in the higher strata above cyclones and anticyclones. About five years ago Hann published the sensational discovery that in the Alpine region in anticyclones, notwithstanding the great cold at the surface of the soil, the mean temperature of the column of air between this ground and the level of 3,100 meters above the sea, was higher in the centre of anticyclones than in cyclones. A further extension of this investigation to other portions of the world promises further important conclusions. In such work observation and study must go together in order to further the advancement of science."

FOG IN NEW YORK HARBOR.

Owing to the clear sky that prevails within areas of high pressure the radiation of heat from the ground or the ocean surface and from the lowest stratum of air, proceeds more rapidly and, as is well known, during such periods mist and fog are formed in the lower air. Radiation proceeds uninterruptedly during the night time from the upper surface of foggy air and the depth of the layer of fog steadily increases, so that oftentimes the heat of the sun, in the middle of the day, is not sufficient to dissipate the fog formed at night. It has often been remarked that the lookout at, or above, the main top overlooks the ocean of fog. In general, a dense fog implies clear sky above it and by attention to the movement of areas of pressure it becomes possible to predict fog on our coast.

On Tuesday, December 17, and Wednesday 18, high pressure prevailed off the middle Atlantic Coast with northeast winds shifting to southwest at New York, N. Y. During Tuesday night and the greater part of Wednesday dense fog prevailed in both the upper and lower bay; the Sound steamers did not attempt to come through Hell Gate; the ocean steamers were detained below quarantine; nothing could be seen at Sandy Hook and all movements were guided by the sound of the fog signals. This fog was attributed by some to the unseasonably warm weather prevailing all along the neighboring coasts. The extreme temperatures were as follows:

Locality.	17th.		18th.	
	Min.	Max.	Min.	Max.
	°	°	°	°
Nantucket	32	36	32	50
New York	26	42	34	48
Philadelphia	26	44	34	50
Atlantic City	24	.....	38	.....

These figures do not show any temperatures that are unusually high for this region, neither is the occurrence of fog unusual at this season; it is, in fact, the ordinary accompaniment of areas of high pressure in the winter time over the ocean.

SNOWFALL IN NORTH DAKOTA.

With regard to the snowfall in North Dakota, Mr. B. H. Bronson, in his November bulletin says:

The principal feature was the unusually early fall of snow, which became general over the State by the 5th instant, and was very heavy in many localities. Old settlers in this section remark that this early snow is the earliest that has occurred during their residence here, and has rendered the hauling of grain by sleds more practicable than by wagons. The snowfall promises an abundance of moisture for the ground when the spring plowing shall commence, but at the present time it renders the pasturage very poor, as the cattle are unable to get at the grass and low herbage. The snowfall is greatly appreciated as it prevents the further destruction of crops and property by prairie fires. The observer at Fort Berthold, in McLean County, reports the pasturage in that section as the poorest in many years, on account of the recent prairie fires, which have also devastated many other sections of the State.

METEOROLOGY AND LOCAL STATE FAIRS.

The need of personal acquaintance between the voluntary observers and the directors of the respective State services is alluded to in the Weather and Crops for January, 1896, by the director of the Illinois Service, and he states his intention to provide for such a need at an early date. On several occasions the presence of some official of the Weather Bureau at a county fair, a State fair, or a general exposition has been productive of many advantages to the Weather Bureau observers who attended such meetings. This was notably so in the case of the expositions at Atlanta and Chicago. In general, State fairs offer an important means of exhibiting, day by day, to crowds of visitors the methods of observation pursued by the Weather Bureau and the numerous ways in which its work can be made useful to the people. In recognition of this general principle a special "Board on Expositions" has been organized at the Central Office, and instruments or publications that are appropriate for exhibition will, it is hoped, always be kept on hand ready for use.

POSSIBLE ADVANCES IN THE WEATHER SERVICE.

We make the following extracts from an excellent address by J. R. Sage, published in the current number of the Iowa Monthly Review:

The weather has been the subject of daily observation and remark in all ages, yet the science which undertakes by rational and philosophical methods to account for the varied phenomena of the atmosphere is comparatively new. By far the greater portion of all that has been achieved in the solution of the intricate problems relating to the weather has been wrought out within the latter half of the nineteenth century. The Weather Bureau, including the State branches, was instituted to serve the people, and to do this efficiently it must be progressive, and the advances that are not only possible, but also most desirable, should be along educational and practical lines. There is need of popularizing the science of meteorology, and more widely disseminating a knowledge of the salient facts that have been learned in this new field of investigation. * * * The special need of this age is science made popular and widely disseminated. To this end there is need of workers and students in this field who are in close touch with the common people and who are able to translate the most scholarly and profound scientific writings into the language of ordinary people. The scientific lore of this age can not be shut up in cloisters nor monopolized by favored classes, but must be scattered broadcast to take root and bear fruitage in the world. I am glad to make note of the fact that the Weather Service is doing excellent work along the line of popular education.

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In practical horticulture success depends absolutely upon adaptation of plant or tree to the climate. And the Weather Service should furnish the necessary data for the study of the effects of climate upon all classes of vegetation.

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For the advancement of both horticulture and the Weather Service, a more close and intimate relation should be established between them.

Every man engaged in practical horticulture as his chief vocation, should be a thorough meteorological observer, with a full equipment of the best scientific instruments to be obtained. * * * When the horticulturist is fully equipped and trained as a meteorologist he should then join the corps of voluntary observers connected with the State and National Weather Services, thereby adding his quota to the general fund of knowledge for the benfit of the public.

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But, after all, those who serve the public thus gratuitously are recipients of direct benefit in the form of scientific knowledge, and the satisfaction resulting from serving their State and nation.

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We are just beginning to study some elementary lessons in the costly school of experience; to learn how to retain our vast patrimony of soil fertility and how to handle the rainfall so as to dispose of the surplus and provide for the storage of moisture for occasional seasons of deficiency. The tendency of the climates of all mid-continent regions is toward extremes. The means may be constant through long periods, but the wide departures and sharp reactions are the special features of the climate that test the hardy qualities and vitality of all forms of animal and plant life.

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I have only attempted to suggest some of the possibilities of advancement in this branch of the public service, along these economic and educational lines. To make this service most valuable to the public there is required the active cooperation of a large number of intelligent observers. Large masses of facts and figures should be collected and tabulated, and experts should give them careful study to find out what they mean. There is mighty little in any of the books to help us in the solution of the many intricate problems that perplex us. We must closely study the facts and question nature. The text-books of meteorological science are mainly in the fields, groves, forests, and on the mountain tops. All the elements are vocal with instruction; the revolving old earth and the great dome of the sky above are thickly set with object lessons for our study.

OBSERVATIONS AT HONOLULU.

Meteorological observations at Honolulu, Republic of Hawaii, by Curtis J. Lyons, Meteorologist to the Government Survey.

Pressure is corrected for temperature and reduced to sea level, but the gravity correction, —0.06, is still to be applied.
The absolute humidity is expressed in grains of water, per cubic foot, and is the average of four observations daily.
The average direction and force of the wind and the average cloudiness for the whole day are given unless they have varied more than usual, in which case the extremes are given. The scale of wind force is 0 to 10. Two directions of wind, connected by a dash, indicate change from one to the other; also same for force.
The rainfall for twenty-four hours is given as measured at 6 a. m. on the respective dates.

November, 1895.	Pressure at sea level.			Temperature.					Humidity.			Wind.		Cloudiness.	Rain measured at 6 a. m.
	9 a. m.	3 p. m.	9 p. m.	6 a. m.	2 p. m.	9 p. m.	Maximum.	Minimum.	Relative. 9 a. m.	Relative. 9 p. m.	Absolute.	Direction.	Force.		
	Ins.	*Ins.*	*Ins.*	°	°	°	°	°	%	%					*Ins.*
1 ..	30.10	29.99	30.09	76	81	78	82	75	60	64	6.7	ne.	5	4	0.10
2 ..	30.12	30.02	30.08	76	80	77	82	73	64	71	6.9	ne.	5	5	0.05
3 ..	30.10	29.99	30.09	76	81	78	82	75	60	64	6.7	ne.	5-6	4	0.10
4 ..	30.10	29.99	30.04	76	80	77	81	74	68	67	6.8	ne.	4	4	0.06
5 ..	30.04	29.96	30.02	75	79	75	82	74	64	74	6.8	ne.	3	5	0.00
6 ..	30.03	29.96	30.04	66	79	72	81	66	68	90	7.1	ene.	3	8	0.33
7 ..	30.07	30.00	30.09	72	79	78	80	70	67	68	7.0	ne.	5	8	0.28
8 ..	30.15	30.05	30.16	75	78	77	79	74	60	68	6.4	nne.	5-6	6	0.17
9 ..	30.18	30.09	30.16	72	78	77	79	74	77	68	7.0	ene.	6	7	0.15
10 ..	30.17	30.05	30.13	75	80	76	80	74	64	74	6.8	ene.	6	6	0.10
11 ..	30.14	30.04	30.08	74	80	75	81	73	71	77	7.0	ne.	5	4	0.03
12 ..	30.09	30.02	30.08	70	81	74	84	68	75	80	7.6	wsw.	1	3-6	0.09
13 ..	30.06	29.98	30.05	70	79	76	82	69	77	81	8.0	sw.	1	3-7	0.00
14 ..	30.00	29.90	29.94	76	78	76	82	75	80	91	8.5	sw.	3	5-10	0.02
15 ..	29.96	29.92	30.00	71	74	71	75	69	92	68	6.8	sw-n	1-4	10-3	1.50
16 ..	29.98	29.88	29.94	68	72	65	74	65	86	79	5.1	n.	1	3	0.03
17 ..	29.92	29.82	29.89	61	70	69	71	59	95	76	5.9	ne-se.	2	10-6	0.60
18 ..	29.87	29.76	29.79	69	77	67	78	66	81	85	6.6	se.	2	4	0.59
19 ..	29.80	29.75	29.81	68	78	65	79	63	70	88	6.5	sw.	2	3	0.06
20 ..	29.87	29.83	29.92	67	76	65	78	65	74	82	6.5	n.	2	9	0.00
21 ..	29.99	29.98	30.00	65	76	71	78	65	65	64	5.7	nne.	3	8-0	0.00
22 ..	30.02	29.98	30.05	63	77	66	79	61	70	87	5.9	s.	1	3	0.00
23 ..	30.10	30.00	30.09	63	78	67	78	62	69	85	6.0	n-s.	1	0-3-0	0.00
24 ..	30.12	30.03	30.10	63	77	67	80	63	70	85	6.2	sw-n.	1-0	1-0	0.00
25 ..	30.13	30.05	30.13	63	79	74	80	63	64	74	6.5	*	2	1	0.00
26 ..	30.12	30.04	30.12	73	73	70	79	72	70	80	7.0	*	2-0	2-10-2	0.00
27 ..	30.11	30.04	30.12	66	79	75	85	62	74	74	6.8	*	1	2	0.16
28 ..	30.12	30.05	30.12	66	79	71	84	66	75	87	7.2	*	1-0	1-0	0.00
29 ..	30.12	30.04	30.11	66	80	70	82	65	72	90	7.1	*	1	2-4	0.00
30 ..	30.11	30.01	30.10	66	78	65	80	65	74	75	6.3	*	2	1	0.01
	30.05	29.97	30.04	69.3	77.9	72.1	78.8	68.3	70.5	87.6	6.7	.....	.....	.....	4.36

Mean temperature: 6+2+9+3 is 73.1; the normal is 74.1; extreme temperatures, 85° and 59°.
*Omitted from original report.

Meteorological observations at Honolulu, Republic of Hawaii, by Curtis J. Lyons, Meteorologist to the Government Survey.

December, 1895.	Pressure at sea level.			Temperature.					Humidity.			Wind.		Cloudiness.	Rain measured at 6 a. m.
	9 a. m.	3 p. m.	9 p. m.	6 a. m.	2 p. m.	9 p. m.	Maximum.	Minimum.	Relative. 9 a. m.	Relative. 9 p. m.	Absolute.	Direction.	Force.		
	Ins.	*Ins.*	*Ins.*	°	°	°	°	°	%	%					*Ins.*
1 ..	30.13	30.04	30.12	60	75	70	77	59	53	64	5.1	nne.	1	1	0.00
2 ..	30.13	30.07	30.15	66	75	72	76	66	61	69	5.9	nne.	2	8	0.00
3 ..	30.16	30.08	30.13	67	76	73	78	67	67	65	5.9	ne.	3	6	0.01
4 ..	30.12	30.03	30.09	73	78	75	80	71	56	66	6.0	ne.	3	4	0.00
5 ..	30.10	30.01	30.07	71	78	70	81	70	70	80	6.6	ene-s.	2-0	1	0.00
6 ..	30.08	29.99	30.08	62	77	71	80	62	74	74	6.1	n-s.	1	2	0.00
7 ..	30.07	29.98	30.06	63	77	69	79	63	70	80	6.2	s-n.	1	2-9	0.00
8 ..	30.04	29.94	30.01	65	77	69	78	63	69	81	6.3	s-ne-sw	2-0	4	0.00
9 ..	30.00	29.92	30.01	65	77	71	79	64	77	81	6.4	w-sw.	1	3	0.00
10 ..	30.01	29.93	30.01	66	77	68	79	64	73	86	6.6	sw.	1	3	0.00
11 ..	30.02	29.93	30.02	67	80	74	80	66	74	83	7.5	sw.	1	4	0.01
12 ..	30.06	29.97	30.14	68	71	68	71	68	94	95	7.5	s-e-w.	1-0	10	1.30
13 ..	30.11	30.03	30.05	74	73	69	79	65	80	95	7.3	ne-n-s.	1-0	10	6.15
14 ..	30.05	29.98	30.05	68	76	72	76	67	91	77	7.1	se.	1	9	0.72
15 ..	30.07	29.99	30.07	72	78	73	79	67	81	78	7.2	e-ne.	1-3	5	0.00
16 ..	30.06	29.97	30.04	74	76	73	78	72	70	70	6.5	ne.	3	5-1	0.03
17 ..	30.04	29.94	29.97	65	76	73	78	65	79	74	6.7	ne.	1	7	0.02
18 ..	29.96	29.91	29.97	67	78	75	81	66	77	77	7.1	ene.	3	4	0.00
19 ..	30.03	29.99	30.07	74	78	76	79	73	68	70	6.7	ne.	2-5	7	0.00
20 ..	30.14	30.04	30.12	74	78	74	78	72	70	81	6.9	nne-ene	1-4	5	0.02
21 ..	30.08	29.96	30.03	73	77	71	78	73	70	85	6.4	ene.	4-2	3-9	0.04
22 ..	30.02	29.93	29.99	66	77	69	78	66	72	86	7.1	e-s.	1	5-7	0.03
23 ..	30.03	29.94	30.01	68	78	68	80	67	81	81	6.8	sw-e.	1	3	0.00
24 ..	30.05	29.97	30.04	66	77	74	79	64	70	70	6.6	nne.	2-5	7-3	0.00
25 ..	30.05	29.99	30.08	72	76	73	77	71	74	80	6.2	ne.	5-3	5-2	0.00
26 ..	30.06	29.98	30.05	73	76	73	78	71	67	69	6.1	ne.	4	2	0.02
27 ..	30.04	29.97	30.04	72	77	73	78	71	70	78	6.8	ne.	4	4	0.00
28 ..	30.05	29.95	30.00	73	76	73	78	72	70	74	6.6	ne.	3-5	5	0.09
29 ..	29.96	29.86	29.93	72	77	69	78	72	70	92	7.0	e-s.	1	2-10	0.07
30 ..	29.86	29.76	29.78	65	76	71	79	65	80	94	7.5	n-s-e-se	4-0	4-10	0.00
31 ..	29.78	29.74	29.85	70	77	70	79	68	81	80	7.4	sw-w.	3-1	3	3.92
	30.04	29.96	30.03	68.7	76.6	71.6	78.3	67.5	....	....	.....	.....	2.0	4.9	12.43

The monthly summary for December is: Mean temperature, 6+2+9+3 is 72.3; extreme temperatures, 81° and 59°.
A thunderstorm occurred on the 30th at night.

THUNDER AND LIGHTNING IN DECEMBER.

Mr. John Butterworth, voluntary observer at Detroit, Oreg., writes as follows:

At 12.05 p. m., December 23, while in the midst of a driving snowstorm at Niagara, we were astonished to see a vivid and long-continued flash of lightning, followed quickly by a long and loud peal of thunder. As thunder in Oregon is unusual its occurence in connection with a snowstorm is worthy of record.

Mr. C. Scholz, voluntary observer at Mammoth, Kanawha Co., W. Va., writes that a terrible storm passed over that place between 4.15 and 6 p. m. of December 26; winds of hurricane force doing great damage to timber; lightning observed in the southwest, followed by thunder; snow from 7 p. m. to 9 p. m., after which it cleared up, followed by heavy frost.

FROSTS IN SOUTHERN CALIFORNIA.

Attention has been called to the statement made in the MONTHLY WEATHER REVIEW for September, 1895, page 341, on the authority of Mr. James Boyd, of Riverside, Cal., to the effect that "as a matter of fact the thermometer has seldom been known to fall between sunset and sunrise more than 10° in a cold wave, or from 7 to 8 o'clock at night to the same hour next morning." It seems that this statement represents a popular belief in that section of the country and, that relying upon its truth, many agriculturists are liable to feel at ease in regard to their crops, and omit to take precautions against frost when there is really more danger than they apprehend. In order to give more precise information on this subject the Editor has examined the meteorological records for Riverside, as furnished by our voluntary observer, Dr. F. M. Gardner, beginning with November, 1894, when records for 9 p. m. (Pacific time) as well as the maximum and minimum began to be reported. A table giving the fall from the maximum of the afternoon to the minimum of the following morning shows that the diurnal range may, in extreme cases, be as large as 60°, and is rarely lower than 10°. Of course, the greater part of this fall occurs in the afternoon. The fall

from sunset to the minimum of the following morning is but a small part of the total range, and the fall from 9 p. m. until the following minimum is still less. Those who wish, from observations taken at 9 p. m., to determine the probability that freezing temperatures will occur next morning may be guided by the following table which shows:

1. The greatest fall recorded at Riverside between 9 p. m. and the following minimum.
2. The number of times the fall was 10° F. or more.
3. The number of times the fall was 5° or less.
4. The lowest minimum temperature.

The temperatures recorded by thermometers depend so much upon their exposure that it is best for each agriculturist to keep a record of his own thermometer and not depend too much upon those of distant neighbors. A station on a hillside will show generally smaller ranges than one in a low level valley.

Month.	1	2	3	4
	°	°	°	°
1894, November	15	13	5	32
December	13	5	13	29
1895, January	15	10	14	27
February	25	9	8	30
March	13	7	9	33
April	17	8	12	38
May	18	8	14	42
June	19	18	4	42
July	15	12	4	50
August	15	17	2	50
September	23	19	3	43
October	23	13	4	39
November	13	13	2	29
December	19	11	2	22

In preparing this table no account is taken of an occcasional gap in the continuity of the record, due to the omission of a morning or evening observation. On two occasions, February 11 and December 17, the morning minimum was higher than the 9 p. m. observation, and in many cases, scattered rather evenly throughout the months December to May, the minimum was sensibly the same as the preceding 9 p. m. temperature. It would seem as though the rate of cooling after 9 p. m. must depend entirely upon the clearness of the sky and the wind. If, as is usually the case, there be no wind, then the clearness, that is to say, the formation of fog, haze, or cloud must control the temperature, and as this clearness depends upon the moisture in the air, it would seem that horticulturists could make good use of some form of hygrometer in connection with their thermometers, unless the aspect of the sky suffices.

BLIZZARDS AND SCHOOLS.

A letter from Mr. Oliver Gibbs, Jr., of Ramsey, S. Dak., is published in the current number of Northwest Weather Crops, published by the Minnesota State Service. He calls attention to the fact that—

The blizzard always comes on a day that opens mild and cloudy, like a "down-east" January thaw. On such days, any time in the winter, it is the safest thing to watch out and stay close at home. Keep an eye on the thermometer, and if it turns suddenly cold and the mercury begins to fall rapidly, have everything safe and snug and a line strung from house to barn as soon as the north wind gives warning.

School teachers in country districts should have an understanding with the directors and the pupils that on such days there will be no school. Many lives were probably saved in this town in 1888 by not opening the schoolhouses on the day of that year's blizzard, though the morning was mild and inviting everybody out by the softness of the air.

To put it in another form, the blizzard and the tornado are both immediately preceded by a hot blast of air.

SNOW ROLLERS.

The phenomenon of snow rollers was observed by the passengers on the Flint River division of the Flint and Pere Marquette Railroad on December 10. They report that in large level fields hundreds of snow balls, some of them of colossal size, were rolled together by the action of the wind. The fields were covered with them.

A similar phenomenon is reported from Spokane, Wash. The Spokesman Review, of December 23, published at that place, says:

The wind has been playing strange with the snow in the vicinity of the waterworks on both sides of the river during the last few days, producing hundreds of snow cylinders of uniform size and as perfectly formed as though they had been cast in a mould.

These cylinders are from 12 to 16 inches long and from 6 to 10 inches in diameter, and are hollow, except in the middle. The hollow in each end is funnel-shaped, being widest at the end where the cylinder is quite thin, growing smaller as it nears the middle where there is a solid space. E. E. Alexander, whose farm is near the waterworks on the south side of the river, says there are hundreds of these cylinders near his place and also in the neighborhood of Minnehaha Park.

"It is a strange and beautiful spectacle," said Mr. Alexander yesterday, "and I never saw anything of the kind before. I judge that the conditions under which these cylinders are formed are exceedingly rare. Most of them seem to have been formed Thursday night. For a time the wind blew from the southeast, then it suddenly changed to the southwest, and where there were fence posts or inequalities in the ground these drifts were broken into small sections, which the wind gathered up and started to rolling. The snow was just soft enough to ball, and as these little masses were pushed slowly along by the wind they began to roll, gathering more snow as they went, till the cylinders were formed. They rolled all the way from 20 to 100 feet, and looked like things of life as they sped along until stopped by their own weight. They could only roll about so far, when they became so heavy that the wind would no longer move them, and this accounts for their uniform size."

MOTION OF THUNDERSTORMS AGAINST THE WIND.

The voluntary observer, Mr. A. E. Ackworth, of Mardela Springs, Wicomico County, Md., writes as follows:

The phenomenon of a cloud rising against the wind is a common one in this section when the cloud forms in the northwest with a surface wind blowing from southeast, moderate to fresh. It is chiefly confined to the afternoon, and has all the phenomena so well described in the WEATHER REVIEW for October last by Mr. Bruner.

Another peculiarity of these storms is that they rarely *come up against the tide*, and are almost entirely confined to those of northwest, rarely north and never from northeast unless formed by the junction of the two branches of a cloud that has formed and split at southwest; one part going by west and north to northeast, the other by south and east to northeast.

Another peculiarity is that whatever course the first thunderstorm of the year takes will be that of a majority of them.

In this section the southwest seems the main point of their formation. Yet a cloud forming southeast and coming over from the east is attended by the heaviest rainfall.

METEOROLOGICAL TABLES.

By A. J. HENRY, Chief of Division of Records and Meteorological Data.

For text descriptive of these tables see p. 427.

TABLE I.—*Climatological data for Weather Bureau Stations, December, 1895.*

Stations.	Elevation above sea-level, feet.	Length of record, years.	Pressure in inches.			Temperature of the air, in degrees Fahrenheit.									Humidity and precipitation.				Wind.				Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Monthly temperature data since opening station.			
			Mean pressure, 8 a. m. and 8 p. m. + 2.	Mean reduced.	Departure from normal.	Mean max. and min. + 2.	Departure from normal.	Maximum.	Date.	Mean maximum.	Minimum.	Date.	Mean minimum.	Greatest daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with .01, or more.	Total movement, miles.	Prevailing direction.	Maximum velocity. Miles per hour.	Maximum velocity. Direction.	Maximum velocity. Date.				Absolute maximum.	Year.	Absolute minimum.	Year.
New England.						34.5	+ 2.4										3.06	— 0.6												
Eastport	76	23	29.99	30.08	+ .11	29.8	+ 2.5	53	31	36	0	13	24	24	22	72	2.75	— 1.5	10	11,144	n.	54	s.	31	3	18	10	6.3	54	1877	—21	1884
Portland, Me	103	34	29.96	30.07	+ .05	30.1	+ 2.5	59	19	37	— 1	15	23	24	24	78	3.30	— 0.2	8	6,473	n.	49	se.	31	7	15	9	5.4	60	1889	—17	1872
Northfield	872	9	29.14	30.14	+ .09	24.4	+ 2.8	61	20	33	—13	13	15	32	16	74	4.75	+ 1.6	13	6,852	s.	49	sw.	31	9	9	13	5.9	61	1895	—27	1893
Boston	125	26	29.98	30.12	+ .07	35.6	+ 2.9	64	31	43	8	12	26	29	28	75	2.45	— 1.0	9	9,791	n.	50	s.	31	9	5	17	6.3	66	1881	—12	1883
Nantucket	14	10	30.10	30.11	+ .05	39.6	+ 4.5	59	21	45	22	12	25	23	34	79	2.73	— 0.8	12	11,122	ne.	51	e.	11	11	4	16	6.6	59	1895	— 6	1892
Woods Hole	.....	18	.....	.....	.....	37.6	+ 1.2	57	2	43	18	12	33	21	.....	.....	3.35	+ 0.2	9	14,106	nw.	66	sw.	31	12	6	13	5.5	58	*	— 6	1875
Vineyard Haven	.....	10	.....	.....	.....	40.6	+ 3.2	62	20	47	18	12	34	27	.....	.....	4.71	+ 2.0	10	.....	sw.	.....	.....	.....	9	7	15	.....	62	*	— 4	1892
Block Island	27	16	30.10	30.13	+ .07	37.4	+ 0.2	59	26	42	12	12	33	30	31	78	2.44	— 1.5	7	15,278	ne.	68	ne.	11	7	16	8	5.7	60	*	— 3	1892
Narragansett Pier	.....	14	.....	.....	.....	34.6	+ 1.8	58	20	43	9	7	26	35	.....	.....	2.14	— 1.9	6	.....	ne.	.....	.....	.....	12	3	16	.....	59	1884	— 9	1884
New Haven	107	28	30.01	30.13	+ .04	35.4	+ 2.9	58	20	42	7	13	28	25	26	71	1.91	— 1.7	7	8,193	n.	35	s.	27	10	8	13	5.5	68	1889	—10	1884
Mid. Atlan. States.						38.9	+ 1.5										3.01	— 0.3												
Albany	85	22	30.06	30.16	+ .08	31.9	+ 1.6	61	31	40	— 1	13	34	30	26	84	2.59	— 0.2	10	6,269	s.	42	se.	31	6	11	14	6.5	66	1889	—17	1875
New York	314	26	29.80	30.14	+ .04	36.9	+ 1.1	58	20	43	13	13	31	24	28	73	1.87	— 1.4	7	12,073	nw.	73	w.	27	8	9	14	6.2	68	1891	— 6	1880
Harrisburg	377	8	29.74	30.16	.00	35.1	+ 0.7	61	*	41	12	13	29	28	30	82	3.38	+ 0.2	11	5,363	e.	42	w.	26	11	8	12	5.3	66	1889	— 4	1894
Philadelphia	117	25	30.03	30.16	+ .03	39.2	+ 3.4	66	21	46	13	13	32	28	29	70	1.76	— 0.9	7	8,492	ne.	50	sw.	26	10	7	14	5.9	70	1873	— 5	1880
New Brunswick	.....	9	.....	.....	.....	37.0	+ 2.5	65	20	46	11	13	28	34	.....	.....	2.64	— 1.0	7	.....	nw.	.....	.....	.....	5	8	18	.....	68	1891	— 5	1894
Baltimore	142	25	29.99	30.14	.00	39.2	+ 0.7	61	*	45	14	13	33	22	29	71	2.84	— 0.3	12	6,023	n.	42	s.	26	11	6	14	6.0	73	1889	— 3	1880
Washington	112	26	30.04	30.17	+ .01	38.8	+ 1.0	66	26	46	13	13	32	31	30	74	2.38	— 0.6	9	5,201	s.	42	sw.	26	11	7	13	5.4	73	1873	—13	1880
Cape Henry	.....	22	.....	.....	.....	45.3	+ 2.5	70	2	53	28	6	38	31	.....	.....	6.29	+ 2.1	10	.....	s.	.....	.....	.....	3	15	13	.....	76	1875	7	1880
Lynchburg	685	25	29.42	30.18	+ .02	40.1	+ 0.2	70	26	49	15	14	32	34	31	78	2.80	— 0.8	9	3,101	ne.	33	nw.	26	7	12	12	5.8	73	*	— 5	1880
Norfolk	57	25	30.09	30.16	+ .02	45.2	+ 1.0	69	2	52	24	6	38	28	37	81	3.54	— 0.2	10	7,026	n.	40	w.	31	12	9	10	5.1	75	1891	6	1880
S. Atlantic States.						47.2	— 1.2										2.53	— 1.3												
Charlotte	773	18	29.31	30.16	— .01	42.4	— 1.5	68	25	51	18	6	34	28	32	72	3.32	— 1.4	10	5,452	ne.	48	s.	26	11	8	12	5.5	76	1889	— 5	1880
Hatteras	11	16	30.14	30.15	+ .01	48.4	+ 0.2	69	25	53	31	6	44	22	42	81	3.44	— 2.6	14	11,931	n.	60	n.	10	10	9	12	5.6	73	1894	8	1880
Kittyhawk	9	21	30.12	30.13	+ .04	45.9	+ 0.8	70	2	52	26	6	40	25	40	80	2.55	— 1.8	12	12,447	sw.	66	n.	13	12	9	10	4.9	73	*	8	1880
Raleigh	388	9	29.75	30.18	— .02	43.4	+ 0.2	71	26	52	20	14	35	32	33	72	2.62	— 0.1	8	5,197	n.	37	sw.	30	7	9	15	6.1	75	1889	10	1894
Wilmington	78	25	30.08	30.17	+ .01	48.6	— 0.6	75	2	58	22	14	40	28	38	76	1.40	— 2.1	7	6,541	nw.	48	w.	30	14	6	11	4.5	78	1879	10	1880
Charleston	52	25	30.14	30.19	+ .03	50.9	— 1.0	72	26	58	30	4	43	23	43	81	2.03	— 1.6	11	5,827	nw.	36	w.	30	17	8	6	3.7	78	1889	13	1880
Columbia	.....	9	.....	.....	.....	46.2	— 2.3	75	26	58	19	6	35	39	.....	.....	3.27	+ 0.2	8	.....	sw.	.....	.....	.....	16	6	9	.....	77	1889	9	1894
Augusta	180	24	29.97	30.18	+ .02	47.3	— 2.2	73	*	58	20	6	36	39	35	75	3.75	— 0.0	10	4,221	w.	38	w.	26	16	8	7	3.9	78	1889	7	1880
Savannah	98	25	30.07	30.18	.00	51.0	— 1.9	74	25	61	26	6	41	34	40	75	1.71	— 1.8	8	5,868	nw.	36	w.	30	15	7	9	4.3	80	1875	12	1894
Jacksonville	43	25	30.12	30.17	+ .01	53.3	— 3.2	80	2	64	28	6	43	41	44	80	1.18	— 1.9	7	4,974	ne.	37	sw.	30	14	11	6	3.9	81	1875	14	1894
Florida Peninsula.						63.6	— 3.1										2.74	— 0.6												
Jupiter	38	8	30.10	30.13	— .04	64.4	— 3.2	81	26	70	39	14	59	22	55	77	6.27	+ 4.3	13	8,396	nw.	33	e.	17	7	20	4	4.8	86	1891	24	1894
Key West	22	26	30.11	30.13	+ .01	67.8	— 2.8	80	26	72	52	14	64	13	60	78	0.81	— 1.1	8	9,894	ne.	43	nw.	10	13	10	8	5.0	88	1876	44	1894
Tampa	36	6	30.13	30.17	.....	59.2	— 3.6	80	1	68	32	6	50	29	48	76	1.14	— 1.5	9	4,876	n.	26	nw.	30	13	12	6	4.8	83	1891	19	1894
East Gulf States.						59.1	— 2.5										3.96	— 0.7												
Atlanta	1,131	18	28.94	30.17	— .03	43.6	— 1.7	67	25	52	16	4	36	29	37	82	2.98	— 1.7	10	8,643	nw.	46	w.	30	16	4	11	4.5	72	1889	1	1880
Pensacola	56	17	30.11	30.17	+ .01	51.0	— 4.3	71	8	60	28	4	42	31	41	74	4.33	— 0.4	6	7,972	nw.	40	se.	30	17	9	5	3.9	76	*	14	1894
Mobile	57	25	30.12	30.19	+ .02	49.8	— 3.0	69	24	59	27	6	41	28	42	81	3.83	— 0.7	8	6,443	n.	36	se.	19	15	7	9	4.7	79	1884	14	1880
Montgomery	221	24	29.92	30.16	— .02	47.4	— 3.1	72	25	58	22	6	37	34	37	73	3.44	— 1.6	6	5,505	se.	35	sw.	26	14	8	9	4.6	79	1889	8	1880
Meridian	358	7	29.76	30.16	— .06	46.8	— 3.7	72	23	57	19	6	37	35	36	75	5.28	+ 0.4	10	5,140	se.	33	s.	19	16	3	12	4.4	76	*	9	1894
Vicksburg	254	25	29.84	30.12	— .06	49.8	— 0.5	74	23	59	25	3	41	29	37	67	3.70	— 1.5	7	7,449	se.	36	nw.	30	14	7	10	4.6	79	*	12	1880
New Orleans	54	26	30.12	30.18	+ .04	53.8	— 2.7	75	8	62	34	4	46	29	42	74	4.52	— 0.2	11	7,791	se.	38	se.	19	15	12	4	4.0	81	1894	20	1880
Port Eads	.....	9	.....	.....	.....	58.4	— 1.1	76	*	65	37	10	52	26	.....	.....	3.61	0.0	5	.....	n.	.....	.....	.....	12	15	4	.....	77	*	.....	.....
West Gulf States.						50.4	— 0.7										2.88	— 0.6												
Shreveport	249	25	29.84	30.11	— .05	49.3	0.0	71	1	58	26	30	40	32	37	68	1.87	— 3.1	7	7,508	s.	42	w.	19	14	5	12	4.5	79	*	10	1880
Fort Smith	481	14	29.54	30.07	— .09	42.6	— 0.6	66	18	52	15	3	34	35	34	75	6.00	+ 2.9	8	5,647	e.	30	n.	4	13	4	14	5.5	79	1889	2	1892
Little Rock	302	17	29.77	30.10	— .07	44.2	— 1.0	69	16	52	17	3	36	31	35	76	2.50	— 1.8	10	7,071	s.	31	nw.	29	10	7	14	5.9	78	1889	6	1889
Corpus Christi	20	9	30.13	30.15	+ .01	56.9	— 0.2	75	24	64	28	31	50	31	49	79	0.64	— 1.4	5	8,342	se.	41	nw.	19	11	14	6	4.8	81	*	24	1887
Galveston	42	25	30.12	30.16	+ .02	55.2	— 2.8	74	1	61	32	30	50	20	47	75	4.28	— 0.3	12	8,998	se.	46	nw.	29	12	11	8	4.5	77	1894	18	1880
Palestine	510	14	29.57	30.14	— .03	50.2	— 0.2	73	23	60	24	30	40	31	38	71	4.34	+ 0.8	7	6,506	s.	29	w.	19	11	11	9	5.0	81	*	8	1894
San Antonio	704	17	29.40	30.16	+ .01	54.4	— 0.4	76	11	65	26	30	44	36	35	57	0.55	— 1.2	6	7,496	n.	46	n.	19	18	7	6	3.7	86	1890	10	1880
Ohio Val. & Tenn.						38.8	+ 0.3										3.91	+ 0.4												
Chattanooga	762	17	29.34	30.18	— .01	42.6	— 1.2	66	23	52	15	6	33	33	33	75	3.11	— 1.5	10	6,220	s.	47	w.	26	5	11	15	6.4	73	1889	3	1880
Knoxville	980	25	29.09	30.17	— .03	40.6	— 0.1	68	20	50	14	6	32	32	31	73	2.93	— 1.2	9	3,973	sw.	42	sw.	26	10	8	13	5.8	75	1874	— 5	1880
Memphis	399	25	29.67	30.11	— .07	44.4	+ 0.9	69	24	52	20	3	37	26	34	72	3.09	— 0.7	13	9,304	se.	42	w.	1	10	12	9	5.2	76	*	3	1880
Nashville	545	26	29.52	30.12	— .04	41.4	— 0.8	70	23	49	12	6	34	32	32	74	4.09	+ 0.6	10	6,738	se.	46	se.	19	4	14	13	6.6	75	1874	— 2	1876
Lexington	989	13	29.00	30.10	— .07	37.4	— 0.2	65	*	45	9	6	40	26	30	77	5.50	+ 2.3	11	10,591	s.	60	sw.	26	2	4	25	8.5	68	1889	— 6	1894
Louisville	525	25	29.50	30.10	— .07	39.0	— 0.5	66	19	46	12	5	32	30	29	70	5.31	+ 1.4	14	6,842	se.	32	nw.	26	4	6	21	7.6	74	1875	— 7	1880
Indianapolis	706	25	29.22	30.08	— .06	34.1	— 0.6	62	24	40	9	5	28	25	28	78	4.86	+ 1.5	16	5,620	s.	23	se.	19	4	11	16	6.7	68	*	—15	1876
Cincinnati	628	26	29.40	30.11	— .05	37.3	— 0.1	64	20	44	14	5	31	25	29	74	3.29	— 0.1	13	6,059	se.	36	nw.	26	5	9	17	6.7	72	1875	— 8	1872
Columbus	824	18	29.18	30.10	— .04	34.9	— 0.7	62	20	41	13	6	29	24	29	84	4.14	+ 1.0	15	5,920	se.	29	nw.	26	3	8	20	7.5	67	1889	—12	1880
Pittsburg	842	26	29.18	30.11	— .02	37.4	— 1.6	67	25	44	13	14	31	30	31	81	3.20	— 0.4	13	5,351	se.	31	sw.	30	6	12	13	6.5	73	1885	— 9	1880
Parkersburg	638	8	29.42	30.13	— .06	37.4	— 1.2	68	19	44	15	6	30	26	30	78	3.44	— 0.2	13	4,204	se.	35	nw.	26	5	6	20	7.3	71	1892	— 4	1894
Lower Lake Region.						32.1	— 0.9										4.42	+ 1.6												
Buffalo	690	26	29.29	30.07	+ .01	33.2	— 2.7	63	21	39	7	13	28	24	27	75	5.26	+ 1.9	14	10,510	sw.	78	w.	31	0	12	19	8.3	63	*	— 9	1880
Oswego	335	26	29.69	30.08	+ .02	31.6	— 2.2	64	20	38	2	13	26	22	25	76	5.23	+ 1.8	15	9,836	s.	50	w.	31	4	8	19	7.3	65	1875	—18	1884
Rochester	523	26	29.49	30.07	+ .01	32.8	— 3.3	63	20	39	4	13	27	26	25	76	3.77	+ 1.0	16	6,047	sw.	52	sw.	31	7	11	13	6.3	70	1875	—11	1871
Erie	714	23	29.28	30.08	+ .01	33.1	— 0.4	62	20	39	9	13	27	24	27	78	4.98	+ 1.6	15	9,998	s.	36	s.	17	4	6	21	8.1	70	1889	—11	1880
Cleveland	740	26	29.34	30.07	— .02	33.2	+ 1.7	62	20	39	9	14	27	23	28	82	4.14	+ 1.4	14	11,345	se.	42	w.	30	7	5	19	7.0	68	1875	—12	1880
Sandusky	629	19	29.35	30.06	— .04	33.0	+ 0.7	62	20	38	8	3	28	25	28	81	3.55	— 0.9	13	7,289	sw.	32	nw.	2	6	6	19	7.3	70	1889	—13	1880
Toledo	674	25	29.30	30.06	— .03	30.6	— 0.9	62	20	36	3	13	25	22	27	89	4.23	+ 1.8	16	8,374	sw.	31	sw.	25	6	8	17	7.1	70	1889	—15	1872
Detroit	734	26	29.23	30.05	— .03	29.6	— 1.9	59	25	35	7	13	24	22	26	86	4.78	+ 2.1	17	8,818	sw.	36	sw.	31	9	5	17	6.8	65	*	—24	1872
Upper Lake Region.						26.2	+ 1.2										3.25	+ 1.0												
Alpena	609	24	29.29	29.99	— .04	25.7	— 1.7	54	25	32	6	9	22	24	22	80	2.59	— 0.1	15	7,098	sw.	40	sw.	25	5	6	20	7.7	56	1875	—15	1880
Grand Haven	638	25	29.28	29.99	— .06	30.4	— 0.4	57	25	36	0	13	25	22	26	86	4.93	+ 2.3	15	8,573	sw.	36	sw.	25	0	8	23	8.5	61	1877	—12	1884
Marquette	734	25	29.10	29.93	— .10	24.7	— 1.4	46	17	30	3	30	20	20	20	82	3.02	— 0.7	19	8,807	sw.	46	sw.	13	4	6	21	7.8	59	1875	—20	1880
Port Huron	639	22	29.33	30.05	— .02	28.9	— 0.6	59	25	34	5	5	23	19	24	82	4.17	— 1.8	18	9,084	s.	38	sw.	31	6	9	16	7.0	65	1875	—14	1880
Sault Ste. Marie	642	8	29.24	29.97	— .03	23.6	— 1.7	47	25	29	— 8	8	18	21	19	84	2.69	— 0.6	16	6,219	se.	36	se.	16	3	6	22	7.8	48	1891	—19	1894
Chicago	594	25	29.10	30.02	— .06	29.6	— 0.1	56	25	35	0	3	25	23	24	78	6.76	+ 4.4	15	13,951	s.	54	ne.	11	3	12	16	7.4	68	1875	—23	1872
Milwaukee	673	26	29.25	30.01	— .07	27.7	— 1.4	55	25	32	— 1	3	23	23	23	85	2.60	— 0.5	13	8,353	w.	42	s.	25	6	9	16	7.2	63	1877	—22	1884
Green Bay	617	10	29.30	30.01	— .05	24.6	— 1.6	49	*	30	— 2	3	19	24	18	76	1.78	— 0.9	10	6,542	sw.	30	nw.	1	3	9	19	7.7	51	1894	—21	1886
Duluth	702	26	29.14	29.95	— .13	19.8	— 1.8	40	17	26	— 7	2	14	24	14	80	0.71	— 0.6	9	7,348	sw.	46	nw.	7	12	12	5.9	54	1891	—34	1879
North Dakota.						14.6	— 3.5										2.44	— 0.3												
Moorhead	935	15	28.88	29.98	— .17	14.4	— 3.4	43	28	23	—17	2	6	31	10	85	0.15	— 0.7	4	8,484	s.	42	se.	15	8	9	14	5.7	55	1883	—36	1887
St. Vincent	794	16	28.98	29.91	— .23	10.2	— 3.8	38	15	20	—22	26	0	41	7	90	0.71	0.0	10	6,834	s.	32	s.	15	7	19	5	4.8	52	1890	—48	1884
Bismarck	1,681	22	28.09	30.00	— .14	18.0	— 3.8	48	10	27	—18	2	9	35	7	63	0.27	— 0.5	5	7,622	nw.	38	nw.	28	9	13	9	5.2	64	1890	—38	1879
Williston	1,875	17	27.84	29.96	— .21	16.0	— 3.0	44	27	24	— 8	2	8	32	9	72	0.63	0.0	10	7,701	w.	54	w.	27	10	13	8	5.2	59	1885	—46	1879
Upper Mis. Valley.						33.3	+ 1.1										3.23	+ 1.0												
Minneapolis	.....	6	.....	.....	.....	22.5	— 2.4	42	17	29	— 4	2	16	25	.....	.....	0.15	— 1.6	4	.....	se.	.....	.....	.....	10	7	14	.....	54	1890	—16	1892
St. Paul	850	25	29.03	30.01	— .10	21.1	— 1.9	44	17	28	— 4	2	14	26	15	78	0.38	— 0.9	5	5,795	se.	35	w.	28	9	10	12	5.7	58	1888	—39	1879
La Crosse	720	24	29.30	30.02	— .08	24.2	— 0.2	52	17	31	— 1	9	30	18	19	83	2.36	— 1.0	7	5,485	s.	28	w.	7	9	8	14	6.4	70	1891	—37	1872
Davenport	613	24	29.32	30.02	— .11	28.8	— 0.5	55	*	34	2	5	23	28	23	81	2.54	— 0.8	14	7,300	sw.	36	w.	11	2	13	16	7.2	65	1889	—22	1886
Des Moines	869	18	29.08	30.07	— .08	27.2	— 1.2	57	17	35	0	31	20	28	19	72	1.86	— 0.4	7	6,160	nw.	28	nw.	11	10	5	16	6.3	69	1889	—20	1886

TABLE I.—*Climatological data for Weather Bureau Stations, December, 1895*—Continued.

Stations.	Elevation above sea-level, feet.	Length of record, years.	Pressure, in inches.			Temperature of the air, in degrees Fahrenheit.									Humidity and precipitation.				Wind.				Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Monthly temperature data since opening station.			
			Mean pressure, 8 a. m. and 8 p. m. +2.	Mean reduced.	Departure from normal.	Mean max. and min. +2.	Departure from normal.	Maximum.	Date.	Mean maximum.	Minimum.	Date.	Mean minimum.	Greatest daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with .01, or more.	Total movement, miles.	Prevailing direction.	Maximum velocity. Miles per hour.	Maximum velocity. Direction.	Maximum velocity. Date.				Absolute maximum.	Year.	Absolute minimum.	Year.
Up. Miss. Val.—Con																													
Dubuque	613	25	29.34	30.05	— .10	28.0	+ 2.3	53	17	34	0	2	3	22	24	77	2.75	+ 0.8	6	.....	n.	.....	.....	.....	7	10	14	.....	67	1889	—24	1886
Keokuk	559	25	29.67	30.07	— .08	31.0	+ 1.2	63	17	38	16	3	3	24	31	78	4.24	+ 2.1	11	6,432	sw.	38	se.	24	9	6	16	6.3	69	1880	—22	1872
Cairo	344	17	29.32	30.04	— .11	40.0	+ 0.5	65	24	46	4	5	3	27	35	77	3.25	— 0.1	15	8,507	s.	36	sw.	25	6	7	18	7.1	67	1889	— 7	1873
Springfield, Ill	534	....	29.44	30.04	.....	33.6	+ 0.3	59	24	40	3	3	3	26	33	78	8.08	+ 5.3	14	7,953	s.	35	sw.	24	8	9	14	6.4	68	1893	— 7	1892
Hannibal	571	35	29.44	30.07	— .08	33.0	.....	64	17	40	2	3	3	31	28	75	5.98	.....	10	7,739	s.	41	sw.	17	7	10	14	6.4	74	1875	—17	1872
St. Louis						37.0	+ 0.7	61	24	43	7				29		4.66	+ 2.3	12	9,258	s.	37	s.	17							
Missouri Valley.						30.1	+ 1.5										3.26	+ 2.1												
Columbia						35.2	+ 0.1	65	17	44	— 4	5	26	29	26	80	7.82	+ 6.8	10	7,538	nw.	38	nw.	11	7	6	18	6.9	75	1889	— 7	1892
Kansas City	963	8	29.02	30.09	— .09	32.6	— 0.7	63	17	40	6	3	26	30	29	78	5.12	+ 3.6	10	7,320	n.	37	nw.	11	10	9	12	5.9	70	*	—13	1892
Springfield, Mo	1,324	10	28.61	30.06	— .08	36.2	— 0.8	60	16	42	6	2	2	29	29	78	11.02	+ 8.6	11	8,808	s.	36	sw.	24	9	6	16	6.3	74	1889	—10	1892
Topeka		9				33.4	— 0.8	60	16	45	4	2	2	29			1.77	+ 0.7	7	.....	n.	.....	.....	.....	6	12	13	.....	74	1889	—10	1892
Omaha	1,123	25	28.83	30.09	— .11	29.4	+ 2.4	58	16	37	2	2	2	17	37	71	0.16	— 0.8	3	6,022	nw.	28	se.	16	9	6	16	6.4	71	1890	—17	1894
Sioux City	1,165	7	28.73	30.04	— .05	26.2	+ 2.1	54	10	35	— 5	2	2	17	19	69	0.02	— 1.1	1	8,166	nw.	43	nw.	28	11	10	10	5.2	68	1890	—16	1892
Pierre	1,470	21	28.37	30.02	— .15	26.5	+ 6.0	60	10	38	— 5	2	2	17	17	71	0.01	— 0.5	1	6,582	nw.	40	nw.	28	14	11	6	4.6	67	1894	—34	1884
Huron	1,310	15	28.55	30.04	— .15	21.6	+ 3.4	56	10	33	—10	2	2	14	40	69	0.20	— 0.6	6	10,368	nw.	52	se.	15	9	13	9	5.3	65	1894	—34	1884
Northern Slope.						24.7	+ 0.3										0.20	— 0.2												
Havre	2,477	16	27.22	29.96	— .19	21.2	+ 3.5	60	12	31	—24	2	2	12	35	74	0.37	— 0.4												
Miles City	2,372	19	27.37	30.00	.....	33.0	+ 3.7	54	10	33	— 6	*	2	13	33	75	0.30	— 0.4	6	10,084	sw.	48	sw.	27	10	13	8	5.4	68	1895	—30	1879
Helena	4,108	16	25.77	30.15	— .02	33.6	— 0.1	51	13	31	— 4	*	2	16	28	75	0.77	+ 0.5	10	5,025	s.	47	w.	28	11	15	5	5.0	57	1881	—46	1879
Rapid City	3,200	10	26.51	30.01	— .17	29.4	— 0.5	62	13	40	— 5	2	2	19	33	66	1.13	+ 0.1	7	6,547	sw.	44	sw.	26	3	10	18	6.8	57	1885	—40	1880
Cheyenne	6,105	25	23.91	30.20	+ .05	27.2	— 2.3	60	12	37	—11	3	2	18	29	66	0.11	— 0.1	4	7,721	w.	46	nw.	27	12	16	3	4.3	64	1890	—25	1882
Lander	5,377	12	24.59	30.25	+ .07	18.7	— 4.0	49	6	32		2	2	18	40	69	0.18	— 0.0	4	11,336	nw.	50	w.	27	12	16	3	4.3	57	1890	—24	*
North Platte	2,826	22	27.06	30.14	— .05	29.8	+ 2.1	67	13	42							0.11	— 0.6	0	3,018	sw.	35	w.	31	7	23	1	4.3	57	1890	—26	1892
Middle Slope.						35.5	— 0.3										T.	— 0.6	3	7,053	w.	37	nw.	28	12	16	3	4.2	70	1890	—27	1879
Denver	5,309	25	24.67	30.16	— .02	34.0	0.0	69	13	46	5	29	22	42	9	41	0.03	— 0.0												
Pueblo	4,734	8	25.24	30.16	+ .01	30.9	— 3.8	68	10	44	6	2	19	43	13	53	0.01	— 0.6	1	7,298	s.	60	nw.	30	12	18	1	4.0	74	1885	—25	1876
Concordia	1,410	11	28.55	30.11	— .04	33.8	+ 0.8	62	16	43	6	3	3	24	34	64	0.46	— 0.0	4	5,805	nw.	30	s.	16	17	7	7	3.8	79	1894	—15	1876
Dodge City	2,504	22	27.41	30.13	— .03	33.8	+ 0.7	68	16	46	3	3	22	40	20	69	0.03	— 0.7	2	5,562	n.	43	nw.	28	17	11	3	4.3	72	1889	—10	1887
Wichita	1,351	8	28.60	30.09	— .04	35.4	+ 0.8	66	16	47	11	3	30	32	24	71	0.21	— 0.5	5	7,743	nw.	43	nw.	28	17	7	7	4.2	74	1894	—10	1894
Oklahoma	1,339	....	28.78	30.14	.....	38.4	.....	67	16	47					29	78	1.37	+ 0.5	4	8,099	n.	32	n.	29	20	4	7	4.2	74	1894	— 1	1894
Southern Slope.																	3.78	+ 1.3	6	7,205	n.									
Abilene	1,749	11	28.27	30.16	— .02	45.2	— 1.5	74	21	56	20	*	34	37	30	66	2.66	+ 1.4	7	7,769	w.	36	nw.	19	19	5	7	3.5	81	1893	6	1894
Amarillo	3,691	....	26.26	30.16	.....	35.0	.....	72	13	46	7	26	24	40	20	64	0.79	.....	6	10,901	n.	46	sw.	13	15	11	5	4.0	75	1894	0	1894
Southern Plateau.						42.8	— 4.3										0.50	— 0.4												
El Paso	3,767	18	26.26	30.20	+ .05	42.4	— 2.7	68	7	56	14	31	29	42	16	42	0.31	— 0.3	2	7,701	nw.	46	sw.	16	19	9	3	2.5	76	1880	— 5	1880
Santa Fe	6,998	23	23.24	30.22	+ .07	35.9	— 6.8	52	12	35	— 2	30	17	39	9	52	1.09	+ 0.4	8	5,442	ne.	27	ne.	19	22	5	4	3.0	65	1878	—13	1879
Phœnix	1,106	....	28.96	30.15	.....	54.0	— 3.3	80	12	66	23	30	35	39	31	58	0.09	— 1.0	2	2,989	s.	45	ne.	28	28	2	2	2.3	.....	.....	.....	.....
Yuma	141	20	29.97	30.12	+ .06	48.8	— 4.2	78	12	63	30	30	42	33	23	34	0.00	— 0.6	0	5,464	n.	53	n.	28	28	2	1	1.5	83	1893	25	1891
Independence	3,884	....	26.14	30.22	.....	37.8	.....	66	12	51	16	21	25	35	18	50	0.08	.....	2	4,552	nw.	53	n.	28	18	6	7	3.2	.....	.....	.....	.....
Middle Plateau.						22.3	— 4.7										1.06	— 0.3												
Carson City	4,720	9	25.39	30.27	.....	33.8	— 1.1	65	12	46	3	29	22	44	17	51	1.40	— 1.2	7	.....	n.	.....	.....	.....	17	1	13	4.3	65	1895	— 7	1889
Winnemucca	4,340	17	25.77	30.31	+ .10	36.8	— 5.0	54	11	38	—12	18	15	39	16	65	0.89	— 0.4	12	7,750	e.	58	nw.	28	8	15	8	5.3	65	1878	—20	1879
Salt Lake City	4,345	22	25.77	30.36	+ .12	36.4	— 8.1	46	15	34	2	29	19	42	20	77	0.89	— 0.8	11	3,804	se.	44	n.	28	3	7	21	8.1	61	1874	—10	1879
Northern Plateau.						38.7	— 1.6										1.82	— 0.3												
Baker City	3,430	7	26.51	30.17	+ .04	27.0	— 1.5	46	11	34	— 3	32	20	33	19	73	1.53	— 0.2	16	4,485	se.	36	sw.	31	4	10	17	7.2	53	1892	— 6	1891
Idaho Falls	4,742	6	25.31	30.33	.....	19.0	— 3.7	41	20	38	— 6	4	10	30	14	80	1.01	— 0.7	12	5,320	s.	48	se.	20	3	11	17	7.1	56	1892	—22	1892
Spokane	1,990	14	27.99	30.11	— .01	31.2	+ 0.4	52	11	36	9	22	27	21	27	84	1.01	— 0.3	18	6,229	sw.	42	sw.	23	4	5	22	7.5	57	*	—18	1884
Walla Walla	1,018	10	29.01	30.14	+ .06	37.6	— 1.7	60	*	43	18	18	32	29	34	88	2.49	— 0.3	15	5,967	s.	40	s.	31	2	15	14	6.6	66	1890	9	1889
N. Pac. Coast Reg.						42.4	— 0.3										2.54	0.0												
East Clallam	179	13	29.83	30.03	+ .07	40.5	.....	57	11	45	26	17	36	17	15	90	14.66	+ 4.6												
Fort Canby		11				43.5	— 0.7	56	11	48	31	17	39	15	41	90	25.50	.....	28	.....	e.	.....	.....	.....	4	3	24	.....	.....	.....	.....	.....
Neah Bay	29	12	29.99	29.96	+ .02	43.9	+ 0.7	59	11	50	27	17	35	20	35	84	14.17	+ 3.3	28	16,443	w.	72	s.	31	0	4	27	8.9	58	1886	21	1884
Port Angeles						40.3	+ 2.1	64	11	46	18	17	33	17			23.88	+ 9.4	28	.....	sw.	.....	.....	.....	1	3	27	.....	63	1888	18	1884
Port Crescent						38.2	.....	54	11	44	23	17	34	19			7.95	+ 2.6	23	5,012	s.	37	w.	31	2	12	17	7.5	64	1895	5	1884
Pysht						39.4	.....	56	11	45	23	17	34	15	36	80	10.74	.....	26	.....	sw.	.....	.....	.....	3	2	26	.....	.....	.....	.....	.....
Seattle	119	....	29.88	30.01	.....	41.8	.....	59	11	46	27	17	39	17	39	83	20.50	.....	29	.....	sw.	.....	.....	.....	3	0	28	.....	.....	.....	.....	.....
Tatoosh Island	86	13	29.84	29.94	+ .01	43.2	— 0.5	60	11	48	31	17	39	16	37	86	7.98	.....	25	5,839	s.	33	s.	23	2	4	25	8.5	.....	.....	.....	.....
Astoria		11				43.2	— 1.3	58	11	48	31	17	39	17	39	83	22.44	+ 8.7	29	16,016	e.	60	w.	23	1	6	24	8.6	60	1895	19	1884
Portland, Oreg	157	25	29.92	30.10	+ .02	43.2	— 1.2	57	11	45	30	28	37	18	38	90	17.54	+ 6.5	30	.....	e.	.....	.....	.....	2	3	26	.....	62	1891	10	1884
Roseburg	523	19	29.37	30.15	+ .03	40.8	— 1.5	66	9	47	26	22	37	18	37	86	7.79	+ 0.4	28	7,940	s.	53	se.	31	0	9	22	8.0	65	1886	3	1879
Mid. Pac. C'st Reg.						41.8	— 1.5										8.85	+ 2.4	26	2,479	s.	18	sw.	23	2	10	19	7.5	66	*	7	1879
Eureka	64	9	30.15	30.21	+ .13	46.3	— 3.9										3.15	— 2.6												
Red Bluff	334	19	29.87	30.24	+ .11	46.8	— 1.7	67	4	54	30	*	40	26	43	86	7.50	— 0.6	19	4,071	e.	42	se.	19	8	14	9	6.0	70	1891	30	*
Sacramento	71	19	30.15	30.23	+ .10	43.4	— 4.1	61	7	51	28	29	38	28	35	77	2.99	— 2.3	8	4,347	nw.	36	s.	20	13	8	10	5.1	76	1893	25	*
San Francisco	153	25	30.06	30.22	+ .10	44.8	— 3.7	65	6	52	31	30	37	22	37	79	1.54	— 2.7	8	5,949	se.	42	s.	15	9	11	11	6.2	69	1893	24	*
Point Reyes Light		7				48.6	— 1.8	63	8	52	39	30	44	15	43	84	1.43	— 3.8	9	5,498	n.	34	s.	20	15	11	5	4.7	72	1893	34	*
S. Pac. Coast Reg.						48.0	— 1.8	63	10	52	39	*	43	17			2.27	— 3.6	9	.....	nw.	.....	.....	.....	10	9	12	.....	.....	.....	.....	.....
Fresno	332	9	29.87	30.23	+ .09	51.7	— 1.3										0.61	— 2.2												
Los Angeles	330	19	29.77	30.12	+ .04	43.6	— 3.1	71	5	51	26	29	36	31	37	81	0.78	— 0.7	4	2,253	e.	21	nw.	20	10	8	13	5.9	71	1895	26	1895
San Diego	69	25	30.03	30.11	+ .08	56.4	+ 0.5	86	*	69	34	30	45	28	37	57	0.78	— 3.7	4	2,547	nw.	18	e.	28	22	7	2	2.4	88	*	30	*
San Luis Obispo	201	....	29.97	30.19	.....	55.0	— 1.3	79	12	65	34	30	41	41	35	60	0.27	— 2.1	2	3,162	ne.	18	nw.	16	24	6	1	1.2	82	1874	32	*
						52.7	.....	80	11	65	28	30	41	41	35	60	0.68	.....	2	4,152	n.	34	n.	28	22	7	2	2.6	.....	.....	.....	.....

NOTE.—The data at stations having no departures are not used in computing the district averages. Letters of the alphabet denote number of days missing from the record.

*Two or more directions, dates, or years. †Received too late to be considered in departures, etc.

TABLE II.—*Meteorological record of voluntary and other cooperating observers, December, 1895.*

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Alabama.	°	°	°	*Ins.*	*Ins.*
Alco†	75	20	48.7	4.29	
Ashville*†[1]	70	14	42.8	4.02	T.
Bermuda†	75	17	49.6	3.89	
Brewton				3.00	
Carrollton*†[1]	68	22	45.6	4.50	T.
Citronelle†	86	28	51.6	4.44	
Claiborne†				1.00	
Clanton†	69	19	44.8	3.87	
Collirene*[1]	70	23	47.9	2.70	
Cordova†				4.21	T.
Daphne†	79	25	51.6	4.10	
Decatur†	69	13	41.4	6.27	T.
Demopolis†				3.32	
Elba†	73	20	46.2	4.63	
Eufaula *a*†	70	21	47.4	2.77	
Evergreen†	73	18	47.8	4.16	T.
Florence *a*†				5.46	T.
Florence *b*	70	19	43.6	5.27	T.
Fort Deposit †	72	22	48.8	1.58	
Gadsden†	69	17	42.8	3.93	
Goodwater†	73	15	44.4	4.04	
Greensboro†	74	22	45.5	3.91	T.
Healing Springs†	76	13	46.4	3.38	
Highland Home†	71	22	48.8	3.37	
Livingston†	72	18	45.3	4.84	
Lock No. 4				3.41	T.
Madison Station†	68	16	43.2	5.20	T.
Maple Grove†				2.98	
Marion†	68	22	45.5	2.30	T.
Mobile					T.
Montgomery					T.
Mount Willing†	74	19	50.0	3.84	
Newbern†	74	20	45.8	3.53	
Newburg†	75[c]	14[c]	43.8[c]	6.81	T.
Newton†	75	17	47.0	2.68	
Oneonto†	68	12	41.3	2.31	
Opelika†	69	23	48.0	3.58	
Oxanna†	66	15	41.8	2.34	
Pine Apple†	72	21	46.9	1.05	
Pushmataha†	75	19	47 6	5.00	
Scottsboro†	67	8	43.0	3.08	3.5
Selma †				3.67	
Tuscaloosa†	73	19	42.3	5.74	
Tuscumbia	71	18	43.6	3.08	T.
Union†	71	19	47.4	6.81	
Union Springs†	71	20	45.2	5.04	T.
Uniontown†	73	21	47.4	3.69	
Valley Head†	66	11	42.0	3.25	
Warrior				2.67	
Wetumpka				3.52[b]	
Alaska.					
Killisnoo†	42	15	31.2	8.55	31.5
Arizona.					
Benson*§	78	30	51.2	0.00	
Bisbee†	67	20	44.0	0.48	
Buckeye†	85	30	49.7	0.00	
Calabasas†	70	13	42.2	0.10	
Casa Grande*§	82	28	54.4		
Dragoon †				1.26	
Dragoon Summit*§	62	20	44.2	0.00	
Dudleyville †	72	18	48.3	0.69	
Flagstaff †	56	− 7	27.0		12.0
Fort Apache	62	5	34.0	1.12	0.3
Fort Grant†	73	17	45.3	0.61	
Fort Huachuca†	69	18	43.6	0.55	T.
Gila Bend *a**§	78	34	51.8	0.00	
Gila Bend *b*†	83	34	53.6	0.00	
Gisela †[1]	66	11	39.2	0.58	
Holbrook †	49	7	27.1	0.00	
Maricopa*§	80	18	49.8	0.00	
Mount Huachuca†	65	13	41.6	0.74	
Natural Bridge†				0.95	
Oracle†	66	18	44.0	0.83	
Oro				0.61	
Oro Blanco	70	24	48.7	0.09	
Pantano*§	69	30	45.9	0.00	
Parker †	83	15	47.4	0.00	
Peoria†	77	22	48.1	0.20	
Phœnix	77	17	47.3	0.07	
Pinal Ranch				1.52	T.
Reymert†	66	22	42.4	0.00	
San Carlos†	70	14	42.1	0.45	T.
San Simon*§	74	18	43.7	0.00	
Show Low				1.10	11.5
Signal†	75	18	46.5	T.	
Sulphur Spring Valley†				0.22	T.
Texas Hill*§	75	18	45.3	0.00	
Tucson *c*†	85	14	48.5	0.08	
Walnut Ranch*†[1]	65	16	39.6	0.61	
Wells	72	20	45.8	0.17	
Whipple Barracks†	69	6	84.5	0.50	
Wilgus†				0.53	
Willcox*§	87	20	41.5	0.40	
Arkansas.					
Arkansas City†				1.10	
Bee Branch†	71	12	45.6	3.90	1.0

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Arkansas—Cont'd.	°	°	°	*Ins.*	*Ins.*
Blanchard Springs†	75	17	46.1	2.54	T.
Brinkley†	70	20	46.1	3.55	5.0
Camden *a*†				2.06	0.2
Camden *b*†	73	19	45.6	2.03	1.8
Conway*[1]	67	18	42.8	4.18	5.0
Corning†	65	15	39.3	2.75	3.7
Dallas†	64[b]	13[b]	40.0[b]	5.84	
Dardanelle†				1.71	
Elon†	78	30	50.0	2.75	0.2
Fayetteville†	63	10	41.0	6.12	0.5
Forrest†	71	18	45.2	2.81	4.0
Fort Smith					0.3
Fulton†				1.48	
Gaines Landing†				1.43	1.0
Helena *a*†				2.80	0.2
Helena *b*	69	21	44.4	2.60	
Hot Springs *a*	67	18	45.8	4.00	5.0
Hot Springs *b*				3.70	3.5
Hot Springs (near)				4.62	4.0
Keesees Ferry†	64	6	41.2	7.42	0.2
Kirby†	66	18	44.4	5.55	T.
La Crosse†	64	8	39.2	3.44	3.0
Little Rock					3.1
Lonoke*§	70	20	44.2	2.87	0.8
Luna Landing*§	70	22	48.0	3.14	
Madding[2]			50.0	5.11	3.5
Malvern†	68	16	41.8	3.54	5.0
Mount Nebo†	59	10	41.6	5.82	T.
New Gascony*[1]	68[d]	20	47.5[c]	2.56	3.5
Newport *a*†				4.28	0.5
Newport *b*†	66	12	42.2	4.72	3.0
Newport *c*†	67	16	43.3	4.38	3.0
Osceola†	66	19	44.0	4.63	4.0
Ozark†	65	15	43.2	6.39	0.5
Pine Bluff†	71	20	49.0	3.12	2.8
Pocahontas†	63	11	38.6	2.21	0.3
Rison†	72	17	45.1	3.00	3.0
Russellville†				1.31	0.1
Silver Springs†	64	5	39.4	6.67	0.8
Stuttgart†	70	19	44.1	3.70	4.5
Texarkana†	78	20	44.1	1.47	T.
Warren†[1]	72	20	46.2	2.65	0.5
Washington*†[1]	70	22	46.0	3.42	0.4
Wiggs				5.24	0.5
Winslow†	59	8	35.3	10.04	1.5
Witts Springs †	59	6	40.2	9.47	2.5
California.					
Adin	58	−19	29.0	2.26	15.0
Ager	58	4	31.6	2.71	14.5
Agnew	64	34	45.3	1.15	
Arlington Heights	84	29	52.0	0.18	
Athlone*§	72	28	49.4	0.76	
Ballast Point L. H				0.35	
Barstow†	70	16	43.2	0.00	
Bear Valley†				9.45	46.0
Berkeley	58	34	46.8	2.20	
Bishop†	57	9	33.6	0.03	
Bishop Creek*§	61	7	30.5	T.	
Boca*§	79	− 5	31.2	3.07	15.5
Bodie†	51	−19	30.6	1.35	12.5
Bowmans Dam†				11.20	48.0
Caliente*§	65	27	46.1	1.20	
Calloway Canal†				0.22	
Cape Mendocino L. H				6.93	
Cedarville†	54	− 4	28.6	1.84	25.2
Centerville*[1]	64	37	50.2	1.36	
Chino*†	85	27	52.9	0.66	
Chico*§	68	28	45.3	1.78	
Cisco*§	47	14	28.6		44.0
Claremont†				0.90	
Cloverdale*[1]	59	30	48.2	5.63	T.
Colegrove				0.98	
Corning*§	62	30	45.9	2.17	
Coronado	88	44	61.9	0.27	
Crafton	76	26	47.4	0.54	
Crescent City†	63	30	46.3	7.11	
Crescent City L. H				9.83	
Davisville *b*	85	29	52.8	1.19	
Delano*§	67	27	45.8	0.12	
Delta*§	68	30	49.2	6.38	4.0
Drytown	64	34	43.2	1.96	
Dunnigan*§	65	28	45.0	1.26	
Durham*[1]	54	26	40.1	1.55	
East Brother L. H				1.10	
Edgwood*§	56	7	32.7	2.21	17.0
Edmanton*†[1]	57	10	31.7	9.22	32.0
Escondido	80	22	50.6		
Evergreen				1.19	
Fall Brook*[1]	88	32	52.4	0.47	
Folsom City *b*[1]	63	30	44.4	1.73	
Fordyce Dam				10.19	101.0
Fort Bragg†	71	27	49.8	4.84	
Fort Ross				6.02	
Fort Tejon				1.25	
Georgetown†	67	23	42.8	7.27	10.0
Glendora				1.15	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
California—Cont'd.	°	°	°	*Ins.*	*Ins.*
Goshen*§	70	22	41.9	0.25	
Grass Valley				7.27	4.0
Greenville†	54	− 2	31.2	5.17	12.5
Guinda				1.92	
Healdsburg*[1]	66	27	48.5	4.56	
Hollister	68	23	46.0	1.07	
Hueneme				0.23	
Humboldt L. H				7.47	
Hydesville†	64	26	44.8	6.17	
Indio*§	82	19	54.9	0.00	
Iowa Hill*[1]	71	28	46.4	5.87	6.0
Jackson	58	24	40.9	3.67	
Jolon				0.50	
Julian†	70	23	44.6	0.75	T.
Keeler*§	66	28	43.4	T.	
Keene*§	68	28	40.7	1.90	
Kennedy Gold Mine	61	24	41.6	3.62	
Kernville				0.40	
King City*§	68	20	45.8	0.49	
Kingsburg*§	65	23	43.1	0.55	
Kono Tayee	66	29	44.0	2.12	
Lagrange*§	72	27	45.2	1.55	
La Porte*†[1]	59	12	31.5	9.98	41.0
Lemoore *a**§	70	22	41.8	0.24	
Lick Observatory†	67	23	41.4	3.16	9.0
Lime Kiln	68	25	44.3		
Lime Point L. H				1.62	
Lodi	62	26	44.8	1.50	
Los Alamos†				0.50	
Los Gatos *b*	58	31	46.2	2.22	
McMullin*[1]	68	20	42.8		
Malakoff Mine*[1]	70	22	40.1	7.36	9.5
Mammoth Tank*§	81	22	51.2	0.00	
Manzana	65	16	38.9	0.18	
Mare Island L. H				1.11	
Merced*§	65	27	45.2	1.03	
Middletown*†[1]	66	22	42.3	5.59	
Mills College				1.93	
Milton (near)*[1]	65	31	47.8	3.09	
Modesto*§	72	26	44.0	1.28	
Mohave*§	68	18	42.8	0.00	
Mokelumne Hill*§		29	41.2	2.88	3.0
Monterey*§	68	28	53.2	1.46	
Mount Frazier†				0.68	
Mount Glenwood*[1]	62	28	45.4	2.53	
Mutah Flat†				1.10	
Napa *b*	64	32	47.6	1.47	
Needles†	69	30	47.6	0.00	
Nevada City†	65	20	39.7	6.14	10.0
Newcastle *a*†	58	27	41.3	2.91	
Newhall*§	83	19	48.1		
Nordhoff†	88	24	50.6	0.62	
Oakland *a*	62	32	46.9	1.74	
Ogilby*§	77	39	52.0	0.15	
Oleta*[1]	60	24	40.5	3.50	2.0
Orange	79	29	53.4	0.46	
Orangevale†	60	27	44.1	1.86	
Orland*§	62	28	43.2	1.15	
Ormonde†				6.82	13.0
Oroville *b*	60	28	46.1	2.59	
Palermo†	60	26	43.4	0.67	
Paso Robles *b*	64	20	41.8	0.55	
Picacho	78	28	54.0	0.00	
Piedras Blancas L. H				0.25	
Pigeon Point L. H				1.83	
Pilot Creek				8.28	50.0
Placerville *b*	60	17	39.0	5.24	0.8
Point Ano Nuevo L. H				0.14	
Point Arena L. H				4.53	
Point Bonita L. H				2.78	
Point Conception L. H				0.18	
Point Fermin L. H				0.20	
Point George L. H				2.54	
Point Hueneme L. H				0.38	
Point Lobos	56	38	47.7	1.06	
Point Loma L. H				0.05	
Point Montara L. H				2.18	
Point Pinos L. H				2.38	
Point Reyes L. H				2.27	
Point Sur L. H				1.30	
Pomona (near)	85	28	52.6	0.66	
Portersville*§	70	30	45.5	0.51	
Poway				0.57	
Quincy†	51	7	32.0	5.07	12.0
Ravenna*§	71	27	47.9	0.00	
Redding *b*†	64	28	42.4	4.36	T.
Reedley (near)*[1]	72	27	44.4	0.60	
Represa	64	28	46.6	1.95	
Rio Vista	62	24	43.0	1.17	
Riverside†	85	22	51.4	0.25	
Roe Island L. H				1.25	
Rosewood	66	16	40.2	3.25	
Sacramento *a*	65	26	45.2	1.50	
Salton*§	110	18	60.2	0.00	
San Bernardino†	84	24	51.0	0.66	
San Jacinto	82	19	48.6	0.34	

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
California—Cont'd.	°	°	°	*Ins.*	*Ins.*
San Jose[b]	64	30	44.8	0.84	
San Leandro[*1]	72	36	51.3	2.25	
San Luis L. H				0.53	
San Luis Obispo[a]				0.84	
San Mateo[*5]	64	34	50.2	1.63	
San Miguel[*5]	69	20	44.3	0.56	
San Miguel Island†	72	40	54.6	0.48	
San Rafael†	62	26	43.8	3.99	
Santa Ana[*5]	95	30	64.2	0.70	
Santa Barbara[a]	84	38	55.1	0.93	
Santa Barbara L. H				0.98	
Santa Clara[a*5]	62	28	47.9	0.77	
Santa Cruz[b†]	73	29	50.7	2.15	
Santa Cruz L. H				2.40	
Santa Maria	78	31	52.4	0.60	
Santa Monica[*5]	69	42	59.2	0.33	
Santa Paula[b†]	85	32	54.2	0.85	
Santa Rosa[*5]	67	25	46.4	2.95	
Saticoy				0.50	
Shasta				5.53	0.8
Shasta Springs†	60	13	34.8	3.02	20.0
Sneddens Ranch†				0.55	
S. E. Farallone L. H				1.74	
Stanford University	60	28	45.2	0.11	
Stockton[a]	62	25	43.9	1.20	
Summerdale†				3.11	24.0
Susanville†	50	5	32.9	2.91	17.5
Sutter Creek[*5]	57	22	37.2	2.47	
Tecarte Dam[*4]	79	18	39.4	0.56	
Tehama[*5]	62	30	45.3	2.50	
Tejon Ranch				1.06	
Templeton[*5]	68	21	43.4	1.21	
Trinidad L. H				6.99	
Truckee[*5]	50	−10	26.6	2.96	29.0
Tulare[b]				0.45	
Tulare[c]	80	22	44.6	0.36	
Turlock[b†]	65	24	43.3	0.84	
Ukiah†	62	21	42.9	4.98	
Upper Mattole[*1]	74	30	46.8	9.58	
Vacaville[a*1]	64	29	45.3	1.87	
Ventura†	81	36	55.2	0.67	
Volcano Springs[*5]	84	18	55.2	0.00	
Walnut Creek	60	36	44.5	1.49	
Washington[*1]	65	14	36.4	5.55	7.0
West Point†				3.83	4.0
Wheatland	58	25	42.5	1.51	
Williams[*5]	63	27	44.7	1.01	
Willows[b*5]	60	28	44.1	0.82	
Wilmington[*5]	77	38	59.5		
Wire Bridge[*5]	59	22	43.6	2.74	
Yerba Buena L. H				1.22	
Yreka†	57	1	31.0	4.31	
Yuba City[*5]	62	34	48.2	1.35	
Engineers Quarters‡				1.78	
Morses House‡				3.11	2.5
Grass Valley‡				2.32	1.9
Deep Creek‡				1.09	3.0
Holcomb Creek‡				0.41	1.0
Squirrel Inn‡				1.98	
Green Valley‡				1.40	4.6
Tunnel No. 2‡				0.96	1.3
Colorado.					
Alma†	46	−14	14.8	0.35	
Antlers†	46	−19	16.0	0.36	4.0
Boxelder				0.16	
Breckenridge†	60	−26	13.2	2.67	26.7
Brush	60	− 6	29.2	1.00	10.0
Byers[*1]	65	10	25.0		
Canyon†	67	− 4	33.0	0.43	7.0
Capps				1.90	19.0
Castle Rock†	64	−12	27.6	0.20	2.0
Climax†	39	−23	7.4	4.50	45.0
Collbran				1.48	14.8
Colorado Springs†	66	− 1	38.5	0.18	2.9
Cope†	64	0	30.9	0.10	1.2
Crook[a]	61	− 2	29.1	0.08	0.8
Deertrail[*5]	56	3	34.0		
Delta†	47	− 9	19.3	0.00	
Denver					0.7
Divide Exper. Station	59	−10	23.2	0.71	9.0
Dumont[*†5]	60	0	30.2	T.	T.
Durango†	52	− 4	24.8	1.20	12.0
First View[*5]	64		33.5		6.0
Fleming				0.10	1.0
Fort Collins†	67	− 5	28.6	0.01	T.
Fox				0.17	1.7
Garnett				T.	
Gleneyrie†	64	0	29.0	0.49	7.3
Goldhill[*1]	60	− 5	27.6	0.08	0.8
Grand Junction†	50	− 4	25.0	0.10	3.0
Greeley†	63	− 7	24.5	T.	T.
Gulch†	47	− 9	18.4	0.50	10.0
Gunnison†	43	−35	4.6	0.90	9.0
Holly				0.80	8.0
Holyoke[a]				0.35	4.0
Holyoke[b]				0.60	6.0
Hugo[*†5]	65	− 4	34.0	0.25	2.5
Hugo (near)†	71	− 7	36.2	0.11	1.8
Husted†	66	−11	28.3	0.64	8.0
Jamestown	57	− 5	24.0	T.	T.
Julesburg†	63	0	28.8	T.	T.
Kit Carson[*1]	66	0	28.8		6.5
La Jara†	52	−15	18.8	0.06	1.0
Lake Moraine†	48	−24	18.1	0.68	9.2
Laporte				0.25	
Las Animas†	64	−11	30.7	1.96	16.0
Lay[*†]	40	−22	12.8	1.40	14.0
Leadville (near)[*†1]	65	−19	18.4	0.85	14.0
Leroy†	59	− 1	28.9	0.12	1.2
Longmont†	65	− 4	27.7	0.13	1.3
Longs Peak				0.17	1.7
Loveland				0.20	
Meeker†	46	−25	13.4	0.75	16.5
Millbrook†	57	−30	18.3	1.05	10.9
Minneapolis†	73	3	31.4	0.90	9.0
Monte Vista	44	−30	14.9	0.02	0.5
Montrose†	54	−12	23.4	1.30	13.0
Moraine†	56	− 7	24.0	0.04	0.5
Ouray†	47	− 5	22.6	2.40	24.0
Pagoda	47	−23	14.5	1.35	13.5
Paonia†				0.65	6.5
Parachute†	44	−17	14.4	0.55	5.5
Pinkhamton				0.70	7.0
Pueblo					4.7
Rangely†	41	−33	4.4	0.60	6.0
Rico†	48	−16	18.5	2.75	27.5
River Bend[*5]	64	0	31.3		2.0
Rocky Ford†	68	−10	30.0	0.57	7.0
Ruby†				5.89	62.4
Saguache†	45	−14	16.6	0.00	
St. Cloud†				0.50	1.5
San Luis†	56	−30	15.9	1.81	19.0
Santa Clara[*†1]	66	−12	23.7	2.90	29.0
Seibert†				T.	T.
Smoky Hill Mine†	73	−10	29.0	T.	T.
Stamford[*1]	50	−16	19.6	1.85	18.5
Surface Creek†	43	− 6	22.1	0.55	5.5
Thon†	66	− 5	29.4	0.20	2.0
T. S. Ranch†	49	− 5	22.4	0.45	4.5
Twin Lakes				2.50	25.0
Vilas				0.50	5.0
Wallet†				0.30	3.0
Watkins[*1]	48	6	27.8		
Wray†	65	0	29.8	0.32	5.0
Yuma				0.10	1.0
Connecticut.					
Bridgeport	58	12	35.2	2.45	0.2
Canton†	59	2	32.4	4.10	1.5
Colchester	60	9	35.2	3.58	3.0
Falls Village				4.67	0.8
Greenfield Hill				2.67	T.
Hartford[b]				3.33	2.0
Hartford[c]	59	5	34.0		
Lake Konomoc				2.21	
Middletown	59	4	33.6	3.89	2.0
New Haven					0.5
New London†	57	11	35.4	1.40	4.0
North Grosvenor Dale	62	2	30.4	5.62	10.2
Norwalk	71	10	33.7	2.75	
Southington[*1]	58	6	32.6	3.17	0.8
South Manchester				3.28	3.0
Storrs	57	5	32.9	4.12	5.0
Thompson[*1]	56	6	31.5		
Voluntown†	59	6	34.2	3.36	7.2
Wallingford†				3.13	0.5
Waterbury	59	7	35.2	3.83	1.0
West Simsbury				3.96	3.0
Windsor	59	4	31.7	2.83	4.7
Delaware.					
Dover†	65	17	39.8	1.82	
Milford	69	19	41.8	1.74	
Millsboro	66	16	41.8	2.80	0.5
Newark	63	12	36.0	3.60	T.
Seaford†	66	17	40.6	2.14	1.0
Wilmington†	66	14	39.7	2.16	0.3
District of Columbia.					
Dist'ing Reservoir[*5]	64	11	37.5	2.15	
Receiving Reservoir[*5]	64	13	37.8	2.39	
Washington					1.2
West Washington	72	12	39.0	2.36	1.6
Florida.					
Amelia†	77	27	51.2	1.58	
Archer†	79	22	54.8	1.78	
Avon Park†	83	35	61.7	1.07	
Bartow†	78	30	57.3	1.21	
Brooksville†	78	29	56.2	0.89	
Clermont†	79	33	57.8	1.34	
Earnestville†	79	30	57.2	1.60	
Eustis†	79	30	57.4	1.19	
Federal Point†	79	29	54.3	1.52	
Fort Meade†	79	24	56.0	1.07	
Frostproof[*†1]	82	35	58.8	0.82	
Grasmere†	79	34	56.7	1.11	
Green Cove Springs†	77	26	50.6	1.28	
Hypoluxo[*†1]	81	41	67.1	5.61	
Kissimmee†	81	32	61.8	0.48	
Lake City†	76	28	55.6	1.58	
Lemon City†	86	42	66.6	0.92	
Manatee†	83	29	57.1	1.13	
Merritts Island†	79	38	61.6	1.11	
Milton†				6.45	
Mullet Key†	75	40	58.6	0.68	
Myers†	79	40	62.0	1.76	
New Smyrna†	80	32	56.0	1.39	
Oak Hill[*1]	80	37	60.4		
Ocala[*†1]	78	34	54.0	0.69	
Orange City†	80	32	57.0	0.87	
Orange Park	78	34	52.4	0.78	
Orlando†	83	35	58.2	1.78	
Plant City†	81	27	58.6	1.79	
St. Francis†	82	32	58.0	1.15	
St. Francis Barracks	78	31	54.9	0.50	
Tallahassee†	73	26	49.6	2.34	
Tarpon Springs†	78	31	56.3	0.74	
Georgia.					
Adairsville†[c]	69	14	41.8	3.25	T.
Albany†	76	18	48.6	2.23	
Americus†	75	16	47.8	3.13	
Atlanta					0.1
Blakely[*†5]	73	20	49.6	2.83	
Brag	75	14	49.0	0.93	
Brunswick	78	27	53.0	1.00	
Canton†				3.25	T.
Clayton†	63	12	39.6	5.63	0.5
Covington†	67	15	43.7	3.82	
Dahlonega†	60	13	42.1	4.64	0.2
Diamond†	64	9	38.2	5.71	5.0
Elberton†	74	17	45.4	3.94	
Fleming†	77	16	49.0	2.07	
Forsyth[*1]	78	24	49.6	4.73	
Fort Gaines†	71	18	49.7	2.52	
Gainesville†	65	14	41.5	4.96	
Gillsville†	73	13	43.5	3.33	
Hepzibah[*5]	70	24	47.8	3.90	
Lagrange†	68	15	44.5	3.36	
Louisville†	75	14	45.0	3.10	
Marietta†	70	15	42.4	3.61	T.
Marshallville†	72	21	48.1	3.75	0.2
Milledgeville†	73	21	45.8	3.72	
Millen†	75	15	47.0	2.87	2.5
Monticello[*†1]	71	21	47.6	2.60	
Morgan†	80	16	48.0	2.64	
Point Peter[*1]	60	13	43.6	4.30	
Poulan†	76	16	48.4	2.22	
Ramsey†	60	11	44.6	3.78	1.0
Resaca†				3.30	0.8
Rome†	68	17	42.2	3.80	T.
Talbotton†	71	18	45.4	4.25	
Thomasville†	74	20	51.0	2.37	
Toccoa†	68	14	46.0	2.87	
Washington†	70[k]	25[k]	46.5[k]	3.47	
Idaho.					
American Falls†	46	− 5	23.6	1.60	11.0
Atlanta†	45	− 3	19.8	4.30	61.0
Blackfoot†	43	− 6	21.8		
Bliss†	53	− 2	27.9	1.76	
Boise Barracks†	48	7	30.4	0.69	3.8
Challis	46	−10	20.7	0.55	5.5
Chesterfield†	40	−23	14.5	0.67	6.4
Cœur d'Alene	55	7	30.0		
Corral[*†1]	37	−21	17.4	3.35	33.5
Dairy†	55	1	28.2	0.95	
Downey†	39	−11	19.9	0.61	7.5
Fort Lemhi†	43	− 8	19.8	0.62	8.7
Fort Sherman†	50	4	30.0	5.06	31.9
Fraser†	60	0	28.8	2.50	25.0
Grangeville	52	9	30.9	1.94	19.4
Idaho City†	50	− 7	24.2	2.49	24.9
Idaho Falls					10.4
Kooteni†	52	6	26.8	2.44	16.0
Lake†	38	−16	12.4	3.60	36.0
Lewiston†	60			1.22	2.5
Lost River†				1.65	17.8
Martin†	40	−17	15.0	1.16	21.5
Minidoka†				0.84	6.4
Moscow†	56	− 1	32.4	1.83	
Murray†	42	2	25.6	4.89	57.6
Nampa	50	4	29.9	0.55	
Oakley†	51	− 1	26.5	0.20	2.0
Paris†	45	−16	17.8	0.90	
Payette†	49	− 2	29.6	0.97	8.7
Roseberry	45	−21	18.7		
Salubria†	46	−11	25.9	3.60	34.5
Soldier†	38	−22	15.6	2.98	29.8
Swan Valley†	44	−22	18.2	0.84	12.4
Warren†	52	−16	23.5	4.02	
Illinois.					
Albion†	63	5	36.5	2.81	11.5

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Illinois—Cont'd.	°	°	°	*Ins.*	*Ins.*
Alexander†	60	— 3	34.0	6.82	1.5
Altamont*§	56	— 2	36.0	4.95	11.8
Ashton*†‖	52	— 8	24.2	2.99	2.5
Atlanta	.....	.....	.....	7.77	2 5
Atwood *a*†‖	.....	— 6	30.0	7.43	8.0
Aurora *a*	56	— 6	30.4	5.89	.....
Aurora *b*†	55	— 7	26.9	5.89	3.2
Beardstown†	.....	.....	.....	5.72	T.
Bloomington†	59	— 2	31.0	7.62	2.6
Bushnell†	56	2	31.7	.....	T.
Cairo	.....	.....	.....	.....	10.7
Cambridge	57	2	29.1	3.65	2.3
Carlinville†	59	4	34.1	6.75	4.0
Carlyle	.....	.....	.....	4.53	.....
Carrollton	60	5	33.4	6.70	1.2
Catlin†	58°	4°	30.4°	5.13	9.0
Cazenovia*†‖	56	0	29.0	6.25	2.0
Chemung*‖	50	— 8	27.1	2.59	3.2
Chester†	.....	.....	.....	4.72	6.0
Chicago	.....	.....	.....	.....	3.4
Clane†	62	6	37.2	3.64	12.8
Clear Creek†	57	— 3	28.8	5.16	1.0
Coatsburg†	62	1	32.6	3.68	2.0
Cordova†	.....	.....	.....	2.33	1.3
Decatur†	59	2	33.4	6.47	5.5
Dixon†	56	— 2	27.2	2.00	2.0
Duquoin*‖	61	10	37.1	5.69	11.5
East Peoria†	60	1	32.0	4.66	T.
Effingham†	65	3	37.4	5.70	10.0
Evanston*[10]	48	— 3	28.5	.....	.....
Fort Sheridan†	56	— 3	28.1	.....	.....
Frederick*§	62	— 1	32.1	5.95	1.0
Friend Grove*†[4]	.....	10	38.2	2.05	5.2
Galva†	58	— 3	28.6	4.20	3.8
Gilman†	58	1	32.3	7.91	4.0
Glenwood*†‖	58	— 4	28.1	5.75	3.0
Golconda†	65	14	42.0	3.46	9.9
Grafton†	.....	.....	.....	7.23	3.0
Greenville†	61	5	35.7	5.45	12.0
Griggsville†	63	0	33.6	6.21	1.6
Halliday*§	63°	9°	36.9°	3.56	8.0
Havana†	63	8	35.4	6.03	T.
Herrins Prairie*‖	62	16	39.9	5.70	17.0
Hillsboro*†‖	63	4	36.0	5.44	4.5
Iron†	64	11	38.2	3.40	15.0
Joliet†	60	0	32.0	6.62	1.8
Jordans Grove†	62	7	38.5	5.45	7.2
Kankakee *a*†	62	3	31.3	5.81	.....
Kankakee *b*†‖	60	3	31.0	.....	.....
Knoxville*§	56	0	30.2	5.13	1.3
Lagrange†	56	— 4	28.4	6.04	1.2
La Harpe*‖[b]	60	0	29.6	3.65	1.3
Lanark*†‖	51	— 3	26.8	1.41	.....
Lexington†	58	1	31.0	6.83	1.8
Loami	.....	.....	.....	8.00	0.5
Louisville†	61	3	35.6	3.77	11.1
McLeansboro*†§	.....	9	35.0	2.85	11.2
Martinsville†	60	2	34.3	4.30	12.8
Mascoutah*§	62	3	38.8	5.75	8.5
Mattoon	57	10	36.4	3.36	1.0
Minonk*†‖	54	— 1	29.2	6.33	1.0
Monmouth†	58	— 1	29.8	4.81	2.0
Morrisonville†	60	0	33.3	4.66	5.2
Mount Carmel†	.....	.....	.....	3.55	17.5
Mount Pulaski	60	0	33.2	7.42	5.0
Mount Vernon	70	10	39.3	3.80	10.0
New Burnside†	65	4	36.8	2.05	14.5
Olney *a*‖	60	7	37.0	3.47	12.4
Olney *b*‖	57	4	31.4	3.85	.....
Oregon	55	— 6	26.5	2.63	3.0
Oswego*§	49	— 8	26.4	6.10	0.2
Ottawa†	57	— 2	28.2	5.77	2.2
Palestine†	63	8	35.0	3.60	14.0
Paris†	61[j]	3[j]	33.4[j]	3.05	7.2
Peoria *a*†	.....	.....	.....	4.31	1.0
Peoria *b*	59	5	33.0	5.86	.....
Philo†	58	— 4	31.2	4.99	8.5
Plum Hill*†§	62	10	34.6	4.51	4.5
Rantoul*†‖	58	0	31.3	6.82	7.5
Reynolds	56	— 2	28.7	3.30	3.1
Riley†	53	— 7	26.1	3.00	1.9
Robinson	62	3	34.8	3.94	12.0
Rockford†	51	— 1	26.8	2.59	4.0
Rose Hill *†‖	62	6	36.0	5.05	9.5
Rushville	61	0	29.7	5.90	1.3
St. Charles*†‖	48	— 5	29.3	6.02	0.7
Scales Mound†	53	2	28.4	2.82	2.4
Springfield	.....	.....	.....	.....	1.5
Streator†	58	0	29.6	5.89	.....
Sycamore*†‖	49	— 3	27.1	3.38	2.1
Tiskilwa*§	58	0	28.0	3.89	4.0
Tuscola*†‖	61	1	35.2	4.66	7.8
Walnut *†‖	54[d]	1	28.3[d]	3.55	4.1
Wheaton*§	.....	— 2	25.6	5.78	4.7
Winnebago†	54	— 5	26.0	2.07	2.0
Zion†	54	— 3	26.6	1.58	1.8

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Indiana.	°	°	°	*Ins.*	*Ins.*
Anderson†	60	6	33.4	3.63	17.8
Angola*‖	65	— 1	30.6	6.41	16.8
Ashboro†	69	— 1	35.0	3.97	12.8
Bedford†	62	10	36.0	2.80	9.0
Bloomington†	.....	.....	.....	3.47	15.0
Bluffton†	59	3	31.8	3.77	9.0
Butlerville†	63	9	35.9	3.48	11.6
Cambridge City†	60	6	35.3	3.95	17.6
Columbia City*‖	58	1	30.6	5.89	16.9
Columbus†	63	5	34.2	3.86	12.5
Connersville†	63	7	33.2	3.45	9.8
Delphi	59	4	34.2	4.88	10.2
Edwardsville*†‖	65	14	38.8	4.21	6.2
Evansville†	66	11	36.8	3.91	10.8
Farmland†	63	9	34.0	3.74	20.2
Franklin*‖	62	3	33.9	4.06	17.5
Greencastle†	61	8	33.5	3.40	12.5
Hammond†	56	1	30.6	6.30	7.0
Huntington	60	6	31.8	4.82	16.5
Indianapolis	.....	.....	.....	.....	21.5
Jasper†	63	10	38.8	3.91	13.0
Jeffersonville	64	13	38.9	4.81	6.6
Kokomo†	60	4	32.4	5.68	20.2
Lafayette†	61	— 2	31.5	8.86	9.7
Logansport *b*	61	7	32.9	5.63	16.5
Lyford†	61	0	33.0	4.47	12.8
Madison†	64	13	39.0	3.99	9.5
Marengo*†‖	62	11	37.2	5.61	11.1
Marion†	61	7	33.5	3.27	15.2
Mauzy†	61	5	32.8	4.03	14.8
Mount Vernon†	63	11	37.2	3.19	10.6
Princeton*†‖	62	7	36.5	4.15	16.0
Rensselaer†	65	12	36.5	6.60	2.0
Rockville†	61	0	32.5	3.82	.....
Scottsburg*†‖	62	11	35.8	3.37	10.0
Seymour†	62	10	34.9	3.71	12.5
South Bend†	57	— 1	30.9	8.25	17.5
Sunman	60	— 2	32.9	3.54	13.4
Syracuse†	.....	.....	.....	7.35	18.0
Terre Haute†	63	8	35.8	3.79	8.0
Tipton†	61	2	33.3	4.13	13.8
Valparaiso†	57	— 1	28.7	7.66	9.5
Vevay	68	14	38.8	3.90	11.0
Vincennes†	63	3	33.9	3.27	8.0
Worthington†	62	2	35.0	3.83	16.6
Indian Territory.					
Eufaula†	.....	.....	.....	5.75	2.0
Healdton†	72	15	44.5	7.27	6.0
Kemp†	69	11	43.8	3.57	T.
Lehigh†	68	13	43.4	3.40	.....
South McAlester†	67	17	42.6	2.70	2.0
Tahlequah†	82	0	41.8	5.66	0.6
Tulsa†	.....	.....	.....	7.90	0.5
Vinita†	65	13	38.6	12.70	.....
Iowa.					
Afton	57	— 1	26.0	2.00	10.0
Algona*‖	41	— 7	22.5	0.24	2.0
Alta†	48	— 7	22.8	0.04	0.5
Amana†	54	— 5	25.4	2.52	3.8
Ames *b*	54	— 6	25.0	1.56	12.0
Ames *c*	.....	.....	.....	1.45	12.8
Atlantic†	55	2	25.6	0.66	4.0
Atlantic (near)[1]	58	7	29.8	0.78	4.0
Audubon	55	— 2	26.5	0.65	4.0
Belknap	48	0	27.7	3.26	5.1
Belle Plaine	48	— 8	24.4	2.66	4.6
Bonaparte†	58	— 3	28.6	4.10	2.0
Carroll	53	— 4	24.4	0.30	3.0
Cedar Falls†	51	— 4	24.4	0.90	5.0
Cedar Rapids†	55	0	27.2	2.90	4.7
Centerville†	.....	.....	.....	3.55	T.
Chariton*‖	54	2	28.8	2.40	7.5
Charles City†	40	— 4	21.0	1.03	6.1
Clarinda†	57	— 1	25.0	0.89	7.0
Clinton	55	— 1	27.5	2.24	2.0
College Springs	60	1	28.6	0.94	.....
Corning†	60	0	27.9	0.95	6.5
Cresco†	49	— 8	19.7	1.13	7.0
Davenport	.....	.....	.....	.....	1.8
Decorah†	51	—13	22.8	1.90	7.0
Delaware*§	.....	— 2	23.8	2.53	3.2
Denison†	51	— 3	24.0	T.	T.
Des Moines	.....	.....	.....	.....	9.1
Dows	51	— 9	21.8	0.32	5.0
Dubuque	.....	.....	.....	.....	3.0
Elkader†	51	— 2	25.0	1.97	1.0
Emmetsburg	44	—11	20.4	T.	T.
Estherville	41	—11	22.4	T.	T.
Fairfield†	55	— 4	27.2	3.30	0.5
Fayette†	51	—10	23.8	1.96	4.7
Forest City	43	— 8	19.5	0.35	4.5
Fort Madison*†‖	56	1	32.9	5.74	4.7
Garden Grove	60	— 5	26.2	2.10	4.0
Glenwood†	58	0	30.7	0.32	0.8
Grand Meadow*‖	38	— 2	22.8	1.27	4.5
Greenfield†	57	0	27.0	1.36	7.9

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Iowa—Cont'd.	°	°	°	*Ins.*	*Ins.*
Grinnell†	55	1	26.6	2.16	0.8
Grundy Center	51	— 4	24.0	1.38	6.5
Guthrie Center	58	0	25.2	0.67	6.2
Hampton	43	— 6	21.1	1.31	7.1
Hopeville†	59	0	26.5	1.65	6.5
Humboldt†	51	— 8	23.8	0.24	2.0
Independence†	43	— 5	23.8	1.72	5.7
Indianola†	59	— 2	26.2	3.55	6.0
Iowa City *a*†	55	— 5	27.2	2.84	3.0
Iowa City *b*	48	— 2	27.8	.....	.....
Iowa Falls†	52	— 7	22.4	1.27	8.0
Keokuk	.....	.....	.....	.....	0.9
Keosauqua†	52	— 2	29.2	3.02	T.
Knoxville	56	0	26.3	1.53	6.8
Larrabee†	47	— 9	24.5	0.08	0.8
Le Claire†	.....	.....	.....	2.36	1.2
Lenox*‖	53	4	27.4	2.29	8.8
Logan†	55	— 1	26.8	0.10	1.0
Madrid	50	— 8	23.4	1.40	10.4
Malvern*‖	55	— 8	25.9	0.48	1.5
Marshall†	54	— 8	25.1	1.76	0.8
Mason City†	.....	.....	.....	0.73	7.5
Maxon*‖	62	0	28.8	2.85	5.0
Mechanicsville	52	— 5	25.8	2.26	2.4
Monticello *†‖	49	— 8	22.3	2.47	7.0
Mount Ayr†	59	— 3	26.4	1.68	9.0
Mount Pleasant*‖	57	2	29.6	3.86	1.2
Mount Vernon*‖	54	— 5	25.8	.....	.....
Neola	70	— 7	28.5	0.60	5.0
Newton†	56	— 1	26.0	1.98	5.1
North McGregor†	.....	.....	.....	1.70	0.1
Ogden	54	— 4	24.6	1.00	8.0
Osage*†§	.....	— 2	20.0	1.28	5.5
Oskaloosa†	59	— 7	26.2	1.96	5.0
Ottumwa	58	— 1	28.8	3.95	3.7
Ovid†	58	0	26.4	2.62	5.5
Panama†[2]	.....	.....	33.2	T.	T.
Portsmouth	54	1	28.2	0.20	1.0
Primghar	42	—10	22.8	0.10	1.0
Rock Rapids	42	—16	18.4	0.10	1.0
Sac City†	48	— 3	23.8	0.03	0.8
Seymour†	60	0	28.2	4.55	3.5
Sibley	.....	.....	.....	0.15	1.5
Sidney	51	0	29.0	1.49	3.2
Sioux City	.....	.....	.....	.....	1.0
Spirit Lake†	43	— 9	21.0	0.06	0.5
Toledo	52	— 6	23.8	1.83	3.0
Villisca†	60	— 1	25.8	0.90	5.5
Vinton*‖	51	—10	25.7	1.74	2.0
Washington†	57	— 3	26.8	2.61	2.0
Waterloo	52	— 4	25.0	1.52	3.5
West Bend*†‖	43	— 6	20.8	0.40	4.0
What Cheer†	.....	.....	.....	2.40	4.0
Wilton Junction†	54	— 3	28.2	2.28	1.0
Winterset†	58	— 3	25.4	0.85	8.5
Kansas.					
Abilene†	63	6	32.4	0.30	T.
Achilles*§	70[f]	— 1	24.2°	0.35	3.5
Altoona*†§	60	10	30.9	6.05	6.0
Atchison†	60	3	30.6	2.56	9.2
Baker	61	1	30.4	1.13	10.5
Beloit†	60	5	30.3	0.06	T.
Blaine	60	— 5	30.7	0.77	1.8
Burlington†	62	5	32.8	3.32	1.0
Campbell	59	0	29.8	0.25	0.5
Colby†	67	— 4	29.6	0.48	5.1
Coldwater†	67	3	34.0	0.20	2.0
Collyer*§	64	6	33.2	0.40	4.0
Columbus†	69	7	34.8	10.50	7.5
Concordia	.....	.....	.....	.....	0.1
Coolidge†	65	— 7	28.8	0.60	6.0
Cunningham†	64	1	33.8	0.45	3.5
Dodge City	.....	.....	.....	.....	2.1
Downs	.....	.....	.....	0.10	1.0
Dresden*†§	64	0	32.8	0.35	3.5
Eldorado†	63	4	33.0	2.40	1.0
Elk City*‖	60	11	35.2	6.12	8.2
Ellinwood*§	62	10	30.0	0.54	2.8
Emporia†	66	9	34.4	4.25	5.0
Englewood†	72	8	34.8	0.02	0.4
Eureka†	.....	.....	.....	1.32	.....
Eureka Ranch†	66	— 3	31.6	0.32	3.2
Fort Riley†	67	5	34.4	0.42	T.
Fort Scott	.....	.....	.....	8.03	7.1
Frankfort	63	4	34.6	2.90	3.5
Garfield	.....	.....	.....	0.37	0.8
Girard*‖	62	7	33.2	7.55	7.3
Goodland†	70	3	31.4	0.25	2.5
Gove*†‖	62	5	30.8	0.45	4.5
Grainfield*§	63	11	38.4	0.35	3.5
Grenola*‖	63	9	34.4	3.35	T.
Halstead	58	4	30.4	1.03	4.0
Hays†	68	— 1	30.4	0.07	0.7
Horton†	61	3	30.6	1.21	9.2
Hutchinson†	68	7	37.8	0.56	3.0
Independence†	61	8	34.9	8.20	10.0

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Kansas—Cont'd.	°	°	°	*Ins.*	*Ins.*
Ionia†	62	0	31.4	0.05	0.5
Jaqua†	64	— 9	30.0	0.10	1.0
Lawrence [1]	61*	4	32.2	3.38	7.0
Lebo†	62	3	32.5	3.95	2.5
Lyons	70	6	37.2	0.32	.....
Macksville†	63	2	33.4	T.	T.
McPherson†	64	3	33.6	2.11	20.0
Manhattan *b*	64	5	33.0	0.59	4.0
Marion†	62	5	33.4	0.95	T.
Meade†	75	10	37.2	0.04	0.4
Medicine Lodge†	65	3	34.0	0.61	2.0
Minneapolis†	62	5	32.9	0.10	0.7
Morantown†	60	3	33.0	7.34	16.0
Moriand†	65	— 2	31.0	0.80	8.0
Morton†	72	3	33.5	0.65	6.0
Mount Hope*[1]	66	11	35.9	1.02	2.0
Ness City†	.....	.....	.....	0.25	2.0
New England Ranch†	66	0	33.9	0.12	3.5
Oberlin†	.....	.....	.....	0.50	5.0
Olathe†	60	2	32.5	6.60	13.0
Oswego†	64	7	37.0	12.45	15.0
Ottawa†	63	4	33.6	3.92	6.9
Paola†	60	5	36.2	7.20	15.0
Phillipsburg [f]	66	10	35.4	T.	T.
Pleasant Dale†	66	3	33.2	0.31	1.0
Pratt†	66	0	33.6	0.20	1.0
Rome*†[1]	65	9	35.4	1.81	1.5
Russell†	66	4	34.0	0.08	0.5
Salina†	65	3	34.2	0.23	0.2
Sedan†	66	8	36.6	5.41	4.0
Sharon Springs*[1]	66	3	31.7	1.40	14.0
Topeka	.....	.....	.....	.....	3.7
Tribune†	.....	.....	.....	0.80	8.0
Ulysses†	.....	.....	.....	0.40	4.0
Wakefield*[1]	64	6	34.7	0.26	1.5
Wallace*[1]	58	2	28.8	0.90	15.0
Wamego*[1]	64	6	32.2	1.10	1.0
Wellington*[1]	62	10	38.0	1.63	T.
Wichita	.....	.....	.....	.....	2.0
Winfield*[5]	66	8	34.4	2.35	2.0
Winona*[1]	58	10	30.6	1.32	13.2
Yates Center†	60	4	33.0	3.65	T.
Kentucky.					
Alpha†	71	9	42.4	5.98	.....
Blandville†	64	11	37.8	3.00	13.8
Bowling Green *a**[1]	68	9	37.9	5.50	3.0
Bowling Green *b*†	72	12	39.6	5.17	1.2
Burnside†	.....	.....	.....	3.38	.....
Caddo*†[1]	61	12	33.2	5.60	2.0
Canton*†[1]	70	16	40.7	4.22	.....
Carrollton†	64	12	38.3	3.54	4.2
Catlettsburg†	.....	.....	.....	3.55	2.0
Earlington	67	13	39.6	3.35	6.0
Edmonton†	75	9	39.8	6.06	3.8
Falmouth†	.....	.....	.....	4.71	2.0
Fords Ferry†	69	12	40.4	2.38	9.0
Frankfort†	65	13	40.0	5.20	.....
Franklin*†[1]	70	12	40.4	5.14	5.2
Georgetown	63	9	39.7	.....	.....
Greendale*[1]	62	10	37.4	5.64	3.0
Greensburg*†[1]	66	9	38.9	4.92	1.0
Harrods Creek†	64	13	38.2	4.25	4.1
Henderson†	68	14	41.6	.....	.....
Leitchfield†	67	12	37.4	5.18	3.5
Lexington	.....	.....	.....	.....	3.7
Lola†	67	7	38.2	3.07	9.0
Louisa†	72	9	37.4	3.23	.....
Louisville	.....	.....	.....	.....	9.7
Marrowbone†	67	7	39.1	5.36	5.0
Mount Sterling†	67	7	37.2	4.44	.....
Owenton†	61	12	37.2	5.03	3.0
Paducah *a*†	.....	.....	.....	3.36	11.2
Paducah *b*†	77	14	41.2	2.94	11.0
Pleasure Ridge Park†	65	11	37.6	5.08	6.8
Richmond†	65	8	38.6	3.05	3.0
Russellville†	71	14	40.4	6.68	2.2
Sandy Hook†	71	9	41.3	2.35	2.0
Shelby City*[1]	68	11	39.5	4.53	1.5
Shelbyville†	64	11	37.5	4.50	5.1
South Fork†[2]	.....	.....	37.2	3.56	4.0
Springfield†	67	10	38.0	4.76	5.2
Williamsburg†	.....	.....	.....	2.28	0.1
Louisiana.					
Abbeville	74	30	53.6	4.80	.....
Alexandria†	76	22	50.6	5.44	.....
Amite†	75	21	50.6	7.14	.....
Bastrop†	78	22	50.8	6.00	T.
Baton Rouge†	79	34	51.8	5.62	.....
Calhoun†	74	18	48.1	2.99	.....
Cameron†	79	.....	.....	2.05	.....
Cheneyville†	75	22	50.0	2.33	.....
Clinton†	.....	.....	.....	6.32	.....
Coushatta *b*†	72	22	48.4	2.67	.....
Davis	.....	.....	.....	4.87	.....
Donaldsonville†	78	26	53.0	5.18	.....
Elm Hall	75	25	51.2	3.20	.....
Emilie†	74	25	51.2	5.36	T.
Farmerville	73	20	47.3	2.99	0.5
Franklin†	79	26	53.6	6.06	.....
Grand Coteau	74	30	53.0	4.82	.....
Hammond†	73	22	50.1	4.31	.....
Houma†	76[1]	22[e]	50.8[h]	2.96*	.....
Jeanerette†	80	25	52.2	5.69	.....
Lafayette†	76	24	51.7	6.17	.....
Lake Charles†	78	28	49.8	3.90	.....
Lawrence†	76	30	52.6	5.57	.....
Liberty Hill	76	19	50.2	3.85	T.
Maurepas	76	21	50.8	4.73	T.
Melville†	77	19	52.2	5.40	T.
Monroe†	74	23	49.9	4.47	T.
New Iberia	75	30	53.7	5.75	.....
Oak Ridge†	75	21	46.8	4.32	.....
Opelousas†	77	23	51.6	4.70	.....
Oxford†	74	20	49.1	2.43	.....
Paincourtville†	78	24	52.2	4.56	.....
Plain Dealing†	70[c]	24	46.8	3.28	0.2
Rayne†	83	25	52.8	5.77	.....
Ruston†	72	18	48.4	3.51	.....
Schriever†	81	22	52.3	4.98	.....
Shell Beach	69	32	51.3	3.99	.....
Southern University†	78	25	53.4	5.50	.....
Sugar Ex. Station†	74	25	51.2	5.75	.....
Sugartown†	77	23	51.6	4.94	.....
Thibodeaux	.....	.....	.....	5.41	.....
Trinity†	77	23	52.7	5.34	.....
Venice†	78	30	56 6	3.66	.....
Wallace	76	26	52.4	5.09	T.
West End	.....	.....	.....	4.69	.....
White Sulphur Springs†	78	22	50.2	4.15	.....
Maine.					
Bar Harbor	56	— 5	29.4	3.08	10.0
Belfast*[6]	52	— 4	27.2	4.63	6.0
Cornish*[1]	57	— 3	28.6	5.07	4.2
Eastport	.....	.....	.....	.....	8.3
Fairfield	57	—14	25.5	3.77	.....
Farmington†	56	—12	25.0	6.25	3.5
Flagstaff†	56	—19	21.0	3.62	3.5
Gardiner	57	— 6	27.2	4.40	8.0
Houlton†	56	—19	20.4	4.50	8.0
Kineo†	59	— 7	22.9	2.99	1.7
Lewiston	56	— 6	27.2	5.07	5.3
Mayfield	54	— 9	23.6	5.84	5.0
North Bridgton	53	— 7	25.9	5.79	5.0
Petit Menan*[1]	50	6	29.7	.....	.....
Portland	.....	.....	.....	.....	5.3
West Jonesport*[1]	49	— 7	29.0	.....	.....
Maryland.					
Annapolis	63	17	37.4	2.74	T.
Bachmans Valley*[1]	61	5	34.7	3.68	2.0
Baltimore	.....	.....	.....	.....	0.2
Boettcherville*[1]	66	6	33.6	3.70	3.0
Cambridge†	65	18	41.5	1.65	0.8
Charlotte Hall†	68	13	38.0	1.97	3.5
Cherryfields†[2]	.....	.....	38.3	1.93	2.0
Chestertown†	65	15	38.6	2.40	2.5
College Park	69	17	40.6	2.32	2.5
Cumberland *a*†	64	2	33.9	2.51	3.0
Cumberland *b*	68	2	39.6	2.49	.....
Darlington†	64	11	36.2	3.55	0.5
Deer Park	65	— 7	29.6	1.50	11.0
Denton†	.....	.....	.....	1.49	T.
Easton†	66	16	39.6	1.72	0.5
Ellicott City	64	16	40.0	2.84	.....
Fallston*[1]	60	11	37.0	3.33	1.7
Frederick *a*	65	0	36.4	3.61	2.5
Frederick *b*	62	5	37.3	.....	.....
Grantsville	62	— 2	31.8	2.96	5.0
Great Falls*[5]	54	11	36.8	3.06	.....
Green Spring Furnace	62	0	34.2	2.02	2.8
Hagerstown†	63	1	36.5	2.49	3.0
Hancock	65	— 6	35.0	2.45	2.5
Jewell†	65	14	39.8	2.45	0.5
Johns Hopkins Hospital	61	13	37.0	.....	.....
La Plata†	68*	13*	40.0*	.....	.....
Lisbon	.....	.....	.....	3.62	2.3
Mardela Springs†	66	18	40.0	1.97	0.5
Mt. St. Marys College*[1]	62[d]	13*	36.4[f]	3.24	T.
New Market	63	3	37.4	3.10	2.5
Oakland†	62	— 5	30.8	3.16	17.0
Pocomoke City	70	22	44.6	1.95	0.2
Princess Anne	68	15	40.5	2.00	0.5
Sharpsburg	63	1	34.5	2.33	1.8
Solomons†	62	20	40.1	1.74	2.7
Sunnyside	65	— 2	31.2	2.66	7.5
Upper Marlboro†	67	12	37.2	2.36	1.5
Van Bibber	68	13	35.3	3.61	.....
Western Port	65	3	31.1	1.91	4.8
Westminster	65	9	36.7	3.75	.....
Woodstock	63	10	36.3	2.98	1.5
Massachusetts.					
Adams	58	2	33.0	.....	.....
Amherst	66	— 3	31.4	3.54	8.0
Amherst Ex. Station *b*	65	— 3	32.0	3.94	8.0
Andover	61	2	32.8	1.76	7.5
Ashland	.....	.....	.....	3.50	6.0
Attleboro	.....	.....	.....	2.62	.....
Bedford	62	4	32.3	2.08	6.0
Beverly Farms	54	7	32.2	4.11	14.0
Blue Hill (summit)	60	5	32.8	2.51	8.0
Blue Hill (valley)	61	6	32.7	2.66	.....
Boston *a*	.....	.....	.....	1.78	5.5
Boston (W. B.)	.....	.....	.....	.....	5.2
Brockton *a*	62	8	34.0	2.59	8.0
Brockton *b*	.....	.....	.....	2.95	.....
Brockton *c*	.....	.....	.....	3.07	.....
Cambridge *a*	63	3	33.2	2.19	.....
Cambridge *b*	62	6	32.8	1.90	.....
Chestnut Hill	63	6	33.4	2.33	5.0
Clinton	.....	.....	.....	2.50	.....
Cohasset	.....	.....	.....	2.76	6.0
Concord†	61	4	31.7	2.34	5.0
Dudley [i]	55*	4	31.7	2.30	5.0
East Templeton*[1]	54	0	29.3	2.97	9.0
Egg Rock, Nahant	54	7	33.2	.....	.....
Fall River	60	10	36.0	3.00	6.0
Fiskdale	.....	.....	.....	4.01	.....
Fitchburg *a**[1]	56	2	30.8	3.78	6.0
Fitchburg *b*	61	2	31.1	3.90	6.0
Framingham	60	6	33.4	3.30	7.5
Groton	60	0	30.4	2.56	6.0
Hadley	60	— 6	29.3	.....	.....
Hingham	.....	.....	.....	3.67	13.0
Hobbs Brook	.....	.....	.....	1.84	7.2
Hyannis*†[1]	64	20	37.9	3.75	3.5
Hyde Park*[6]	.....	6	32.0	.....	3.0
Lake Cochituate	61	4	33.0	2.71	6.8
Lawrence	61	4	31.2	2.41	6.0
Leeds	57	2	29.3	4.93	2.8
Leicester Hill	59	2	30.5	3.56	6.9
Leominster	.....	.....	.....	3.80	6.0
Long Plain*[6]	56	8	34.3	2.88	9.0
Lowell *a*	61	4	32.0	2.68	8.5
Lowell *b*	62	2	31.1	.....	.....
Lowell *c*	61	5	33.6	.....	.....
Ludlow Center	55	0	27.9	3.83	4.5
Lynn *a*	58	5	31.0	2.39	.....
Lynn *b*	59	8	33.7	.....	.....
Mansfield*[1]	60	5	32.7	3.25	8.0
Middleboro	62	8	33.2	3.28	12.8
Milton	59	9	34.5	2.55	7.5
Monroe	54	— 9	27.4	5.80	6.0
Monson	61	— 7	31.0	4.25	10.0
Mount Nonotuck	.....	.....	.....	3.42	6.0
Mystic Lake	.....	.....	.....	1.96	4.0
Mystic Station	.....	.....	.....	2.17	.....
Nantucket	.....	.....	.....	.....	2.4
Natick*[1]	58	6	31.8	4.06	7.0
New Bedford *a*	58	10	35.2	2.84	9.5
New Bedford *b*	59	9	35.4	2.63	6.5
North Billerica	63	8	34.6	2.35	6.0
Pittsfield	57	4	28.8	3.83	1.0
Plymouth*[1]	61[f]	18[c]	38.1[c]	3.85	4.0
Provincetown	58	18	37.7	.....	.....
Roberts Dam	.....	.....	.....	2.58	6.0
Roxbury	63	8	36.2	2.25	6.0
Salem	.....	.....	.....	2.65	8.5
Salisbury	.....	.....	.....	2.11	4.5
Somerset*[1]	62	10	36.1	3.20	10.5
Springfield Armory	61	— 1	31.2	2.77	5.0
Taunton *b*	60	9	34.1	3.64	10.5
Taunton *c*	60	4	32.9	3.47	.....
Turners Falls	56	— 2	29.0	3.56	.....
Vineyard Haven	.....	.....	.....	.....	4.6
Wakefield†	62	1	32.4	2.37	4.0
Waltham	.....	.....	.....	2.61	.....
Webster	.....	.....	.....	3.75	9.0
Westboro†	60	0	33.8	2.60	8.2
Williamstown*[1]	56	— 6	29.9	3.11	2.5
Winchendon	.....	.....	.....	3.60	5.0
Winchester	.....	.....	.....	2.64	8.0
Woods Hole	.....	.....	.....	.....	9.6
Worcester *b*	60	5	33.1	4.03	7.0
Michigan.					
Adrian	63	—12	27.1	5.15	16.8
Albion	56	— 3	29.7	8.27	19.8
Allegan	56	— 3	30.8	5.44	8.0
Alma	56	—13	27.6	5.57	16.6
Alpena	.....	.....	.....	.....	10.4
Ann Arbor	54	— 3	28.0	5.21	28.2
Arbela	53	— 9	27.4	5.46	9.0
Ball Mountain	57	— 4	25.9	5.28	15.1
Battle Creek	56	— 2	28.5	7.17	14.3
Benton Harbor	57	0	30.4	10.56	9.5
Benzonia	52	5	26.2	5.21	29.3
Berlin*[1]	59	— 2	26.9	5.66	26.1
Berrien Springs*[1]	57	0	32.3	6.08	16.0
Birmingham	63	— 4	28.3	3.34	15.0
Bronson	55	— 9	28.2	5.37	9.7

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Michigan—Cont'd.	°	°	°	*Ins.*	*Ins.*
Calumet	43	4	22.8	4.88	62.0
Charlevoix	56	8	31.4	1.80	15.5
Cheboygan	53	— 6	24.6	2.51	18.0
Clinton	58	— 5	27.2	5.78	22.0
Detroit					22.5
Fairview	56	— 5	26.0	3.98	11.0
Fitchburg	58	—12	26.9	6.60	17.0
Flint	58	—18	25.8	4.87	.....
Gladwin	51	— 8	27.3	.....	32.0
Grand Haven					5.8
Grand Rapids *a*	59	— 5	29.0	6.25	15.0
Grand Rapids *b*	56	— 3	29.2	5.19	.....
Grape	59	— 5	29.6	4.50	24.0
Grayling	52	— 4	23.6	2.40	16.0
Grindstone City *[9]	52	0	28.1	.....	.....
Hanover	56	— 7	31.6	5.95	30.0
Harbor Springs	45	— 5	26.4	1.20	5.0
Harrison	52	— 6	24.1	3.75	14.2
Harrisville	53	6	26.1	3.90	19.0
Hart				5.50	19.0
Hastings	57	— 3	29.4	5.64	9.7
Hayes	56	— 9	27.8	2.36	3.6
Hesperia	54	— 4	29.4	.....	6.0
Highland Station	58	— 9	25.8	5.95	19.1
Holland *[5]	50	9	32.2	.....	.....
Howell	58	—13	25.1	5.91	16.2
Ivan	50	— 4	24.6	3.01	15.0
Jeddo	58	3	26.8	4.39	13.2
Kalamazoo	56	1	29.8	6.67	11.4
Lansing	56	—10	27.3	5.83	11.2
Lathrop *[1]	44	— 6	21.3	2.34	13.0
Lewiston	51	2	25.3	2.61	8.0
Madison	57	— 9	27.4	5.39	12.5
Marquette					23.0
Mayville	57	— 1	27.6	5.35	16.0
Middle Island *[10]	50	14	32.0	.....	.....
Mottville	57	—11	28.2	7.33	13.2
Mount Pleasant	54	—10	27.8	2.48	16.0
North Manitou Island *[10]	48	15	30.5	.....	.....
North Marshall	55	—10	24.9	5.53	14.0
Northport	50	7	30.0	2.05	16.0
Old Mission	53	6	29.5	1.97	7.8
Olivet	59	— 8	27.4	7.58	21.0
Ovid	55	—12	26.8	5.74	18.0
Parkville				8.22	14.0
Pontiac	59	— 9	26.8	5.69	20.5
Port Huron					9.1
Rockland	47°	0°	21.4°	2.30	22.0
Romeo	58	0	27.3	.....	.....
St. Ignace	49	— 9	25.4	3.22	17.5
St. Johns	56	—10	28.0	6.32	13.8
Sand Beach *a*	59	7	28.7	2.87	.....
Sand Beach *b* *[9]	55	12	29.6	.....	.....
Saranac	56	— 7	28.8	5.82	10.5
Sault Ste Marie					16.7
Somerset	56	—11	26.6	5.02	17.5
South Haven	57	— 1	29.0	7.61	6.5
Standish	50	— 8	25.0	5.86	12.0
Stanton	54	— 9	26.8	4.55	9.5
Sturgeon Point *[10]	48	11	29.9	.....	.....
Thornville	59	3	29.0	4.74	22.0
Three Rivers		— 4	.....	10.56	8.0
Thunder Bay Island *[10]	42	13	28.6	.....	.....
Two Heart River *[10]	46	0	25.2	.....	.....
Vandalia	55	— 3	31.0	8.04	13.4
Ypsilanti	60	—16	26.3	5.21	21.7
Minnesota.					
Ada†	39	—30	12.3	0.14	2.1
Albert Lea†	43	— 5	21.4	0.35	3.5
Alexandria *a*†				0.08	0.5
Beardsley†	42	—13	18.6	0.13	1.3
Belleplaine *[1]	39	—10	14.4	T.	T.
Bird Island	38	—16	18.2	T.	T.
Blooming Prairie†	41	— 8	18.8	0.25	2.5
Bonniwell†	48	—11	18.2	T.	T
Caledonia†	48	— 8	21.5	1.41	8.0
Cambridge†	41	— 9	19.4	T.	T.
Camden†	42	—10	20.6	0.14	2.0
Collegeville	43	— 6	22.1	0.01	0.2
Crookston†	39	—15	13.8	.....	.....
Dawson *[1]	46	—18	12.8	0.03	0.3
Detroit City†	40	—17	16.6	0.18	T.
Duluth					4.9
Faribault†	42	— 7	19.4	0.35	3.5
Farmington†	40	— 8	19.5	0.40	3.5
Fergus Falls†	41	—15	16.4	0.14	1.4
Glencoe†	39	— 9	20.2	0.02	.....
Glenwood†	39	—13	17.0	T.	T.
Grand Meadow†	41	— 7	18.5	0.27	3.5
Grand Portage†				0.99[3]	.....
Granite Falls†	41	—15	19.6	0.04	.....
Hutchinson†	39	—12	16.8	T.	T.
Koochiching†	38	—26	6.8	1.07	6.9
Lake Winnibigoshish *[1]	35	—14	13.6	0.30	3.1
Lawrence†	38	— 7	20.2	.....	.....
Leech Lake[1]	45*	—23	13.0	0.24	1.5
Minnesota—Cont'd.					
Long Prairie†	39	—12	16.2	0.17	0.2
Luverne†	41	—12	20.6	0.14	1.5
Maple Plain	41	— 8	20.3	0.16	0.9
Maplewood	38	— 6	20.7	0.05	0.5
Mazeppa[1]	36*	—16	18.8	0.60	4.0
Milan†	39	—18	17.3	0.05	0.8
Minneapolis *a*†	40	— 6	20.4	0.23	1.0
Minneapolis *b*[1]	40*	— 5	20.3	0.13	0.8
Minneapolis (W. B)					0.6
Minnesota City†	51	—10	23.2	0.82	7.0
Montevideo†	41	—15	18.1	0.02	0.5
Moorhead					1.5
Morris†	40	—14	17.6	0.01	0.1
Mount Iron†	35	—18	14.3	0.47	4.4
New London	40	—14	17.0	T.	T.
New Richland *[10]	38	— 8	22.0	.....	.....
New Ulm†	42	—12	21.9	0.09	0.2
Park Rapids†	44	—20	13.7	0.34	1.7
Pine River *[1]	45	—13	16.4	0.06	0.6
Pleasant Mounds†	42	—12	22.3	T.	T.
Pokegama Falls[1]	34*	—27	11.4	0.48	3.9
Red Lake†	39	—22	14.4	0.45	7.9
Redwing†				0.60	5.0
Reeds†				0.58	5.8
Rolling Green†	40	—10	21.5	T.	T.
St. Charles†	47	—11	30.7	1.17	8.5
St. Cloud	38	—10	17.6	0.00	0.0
St. Olaf	39	—12	16.0	0.10	0.5
St. Paul					3.5
St. Peter†	47	—13	20.4	0.03	0.3
St. Vincent					6.5
Sandy Lake Dam[1]	36*	—19	15.3	0.17	2.2
Sauk Center	38	—14	16.3	0.03	T.
Shakopee[6]	38*	— 6	20.5	0.01	T.
Sunrise City *[6]	38	— 8	18.4	.....	0.9
Tower†	41	—22	14.3	0.40	4.0
Two Harbors†	46	— 7	23.6	0.99	6.0
Wabasha *[1]	40	— 9	21.1	0.69	6.5
Willmar†	38	—15	16.9	T.	T.
Winona	51	— 6	22.6	1.55	8.4
Worthington	40	—18	19.6	.....	.....
Zumbrota *[1]	38	—13	19.7	.....	.....
Mississippi.					
Agricultural College	71	22	45.4	5.43	T.
Austin†	70	23	48.2	2.37	0.5
Batesville†	72	20	44.0	3.94	T
Bay St. Louis†	66	28	50.3	3.28	
Biloxi†	64	36	47.8	3.60	
Briers†	72	22	48.9	4.38	
Brookhaven†	78	19	49.6	7.34	
Canton†	71	24	48.5	5.35	T.
Columbus *a*†				4.60	
Crystal Springs†	74	22	48.6	7.15	
Duck Hill	75°	10°	44.8°	2.45	
Edwards	74	22	49.0	4.56	T.
Fayette†	76	21	49.5	6.98	T.
French Camps†	72	15	45.0	5.46	T.
Fulton†	68	16	42.9	6.86	T.
Greenville *a*	70	21	46.2	3.57	0.2
Greenville *b*†	70	19	44.8	3.58	T.
Itta Bena†[6]	71	23	44.0	3.91	
Jackson†	72	18	45.2	6.77	T.
Kosciusko†	73	20	45.8	4.66	
Lake†	68	19	43.6	6.90	T.
Leaf *[1]	71	24	47.3	.....	
Leakesville†	76	20	50.0	4.11	T.
Logtown†	72	25	50.3	3.84	T.
Louisville†	70	17	46.1	4.76	T.
Magnolia[3]	77	20	50.4	5.29	T.
Mayersville	75	21	49.6	4.70	T.
Meridian					T.
Mico†	74	18	47.0	4.29	T.
Moss Point†	74	26	50.4	5.88	
Natchez†	76	25	51.2	5.20	
Okolona†	70[3]	21[4]	41.0[4]	6.55	
Palo Alto†	72	21	46.2	6.27	T.
Pontotoc†	73	21	45.4	6.58	T.
Port Gibson†	78	20	49.4	5.51	.....
Rosedale†	72	18	43.8	4.29	.....
Stonington *[1]	76	26	50.5	.....	.....
Thornton†	70	25	47.4	5.25	T.
Topton *[3]	74	28	50.9	3.80	T.
Valden†	81	15	48.5	7.34	0.5
Water Valley *† [1]	76	20	44.2	6.11	T.
Waynesboro *a*†	75	20	45.4	4.10	
Williamsburg†	84	22	47.4	7.12	0.8
Woodville†	74	26	50.6	6.46	
Yazoo City†	76	20	47.4	3.44	T.
Missouri.					
Akron				2.83	8.0
Appleton City†	69	6	33.8	8.45	1.0
Arthur†				7.25	5.0
Bethany†	58	0	30.5	2.48	6.0
Birch Tree	62	6	37.9	5.92	2.5
Boonville†				7.89	4.1
Brunswick	60	4	33.2	6.26	
Missouri—Cont'd.					
Carrollton†	63	6	33.6	5.51	5.0
Columbia					2.3
Conception	61	6	32.8	1.66	4.5
Cowgill *[5]	62	4	33.5	5.14	2.0
Darksville†	55	2	32.2	5.72	0.7
Downing				4.53	0.8
East Lynne *[3]	.....	4	32.4	7.11	4.0
Edgehill *[5]	60	4	39.0	5.83	3.5
Eight Mile *[1]	60	6	33.2	6.02	1.4
Eldon *[1]	58	4	36.8	8.88	0.2
Elmira	62	— 2	30.6	4.42	2.8
Emma *[3]	.....	8	34.4	6.35	2.0
Fairport				3.05	9.0
Farmersville				3.79	4.6
Fayette	64	1	34.0	7.51	2.0
Fulton				10.35	1.0
Gallatin *[1]	62	6	30.4	3.63	3.5
Gayoso *[3]		14	37.7	4.04	6.0
Glasgow	61	0	31.5	7.50	1.8
Gordonville *[3]		7	37.6	4.51	7.8
Gorin *[3]	68	6	30.8	5.01	T.
Grove Dale	61	— 7	36.3	8.43	5.6
Half Way	64	0	36.0	9.27	1.0
Hannibal					1.5
Harrisonville†	65	2	31.2	5.52	5.0
Hastain	66	1	37.0	9.72	1.0
Hermann†				8.15	0.3
Houston	65	5	39.6	4.51	T.
Houstonia (near)				7.26	4.4
Humansville	65	7	36.4	8.24	1.0
Irena				1.98	7.8
Ironton *† [1]	59	6	37.1	6.20	5.5
Jefferson City†	60	5	35.6	9.20	1.0
Kansas City					11.5
Kidder	61	— 1	29.2	5.40	5.5
Lamar	66	8	37.0	8.08	T.
Lamonte				7.98	1.8
Lebanon	61	2	37.2	12.07	1.1
Lexington†	63	5	33.5	5.66	4.8
Liberty	65	6	32.2	4.64	5.0
McCune *† [1]	63	— 8	33.5	7.93	1.4
Marble Hill	63	6	37.0	4.37	5.5
Marceline	60	2	30.9	5.57	1.0
Marshall†	63	— 3	32.0	6.13	3.6
Maryville *†	53	1	26.5	1.28	6.6
Mexico†	65	0	33.6	8.13	2.4
Miami				7.10	6.0
Mine La Motte†	60	2	38.0	4.02	7.5
Mineralspring	64	6	40.3	8.86	1.8
Mount Vernon	58	0	34.6	12.52	1.5
Neosho	66	2	38.4	12.21	1.2
Nevada				8.43	6.0
New Haven *[1]	64	10	39.6	7.57	1.0
New Madrid	67	15	43.7	5.33	14.6
New Palestine†				6.71	0.2
Oakfield†	62	5	36.8	5.88	2.5
Oak Ridge *[4]	.....	10	37.8	3.77	7.5
Oregon *a*	62	1	30.6	1.75	8.5
Oregon *b*[1]	60*	1	29.2	1.55	7.7
Osceola†	.....	.....	.....	7.37	4.2
Oto				7.37	0.8
Palmyra *[5]	60	0	32.5	6.42	2.0
Phillipsburg *† [1]	61	2	35.8	13.67	0.2
Pickering *[3]	62	0	29.8	1.46	7.2
Platte River *[3]	62	4	28.8	3.15	8.0
Poplar Bluff	68	12	40.0	3.81	5.0
Potosi	61	— 4	35.0	4.99	8.0
Princeton *[1]	60	3	30.2	2.98	3.5
Rhineland	64	0	35.2	8.22	0.8
Rolla				7.55	2.7
St. Charles	62	5	37.8	6.32	7.0
St. Joseph†				1.73	4.5
St. Louis	61	6	36.0	5.29	3.0
St. Louis (W. B)					3.5
Sarcoxie *[3]	62	4	33.8	11.22	2.2
Shelbina				6.90	1.0
Sikeston	73[7]	12[7]	44.8[7]	3.69	10.0
Springfield					3.0
Steffenville				5.05	T.
Stellada†	63	1	35.2	8.14	0.4
Sublett	60	0	28.7	6.31	3.1
Tindall				2.85	1.0
Trenton	60	5	30.6	3.80	
Unionville†	47	0	27.4	5.42	7.4
Vermont *† [1]	66	2	33.2	7.44	1.0
Virgil City				8.81	2.0
Warrensburg *[1]	64	9	35.5	7.44	.....
Warrenton	62	3	35.1	8.23	.....
Wheatland				9.34	1.2
Willow Springs	61	4	40.4	7.40	1.2
Zeitonia *[1]	53	12	37.3	6.15	5.2
Montana.					
Bigtimber†	64	2	30.3	0.36	2.5
Billings†	48	4	25.6	0.22	2.2
Bozeman†	45	— 4	21.1	1.50	15.0
Butte†	45	— 3	20.6	1.12	14.7

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Montana—Cont'd.	°	°	°	*Ins.*	*Ins.*
Chinook†	52	−26	18.8	0.30	3.0
Choteau†	63	−10	26.6	1.05	10.5
Cokedale†	55	1	26.8	1.35	13.5
Columbia Falls†	49	− 4	23.5	0.24	2.4
Deer Lodge City†	56	−16	21.0	0.39	5.0
Dillon†	44	− 8	21.4	0.40	4.0
Fort Benton†	64	−17	26.4	0.19	1.9
Fort Custer†	52	−13	24.2	0.36	3.6
Fort Keogh†	48	− 9	23.0	0.18	1.8
Fort Logan†	52	−28	18.8	0.47	3.5
Fort Missoula	51	− 6	22.0	1.52	3.2
Glasgow†	46	−29	13.8	1.25	12.0
Glendive†	53	−12	21.6	0.90	5.0
Great Falls†	60	− 9	28.0	0.23	3.3
Havre					3.2
Helena					10.2
Hogan†	56	−11	26.5	1.10	11.0
Kipp†	58	−22	20.0	0.97	9.5
Libby†	49	− 7	25.8	2.78	36.5
Livingston†	53	3	26.8	0.53	5.3
Manhattan†	49	−13	19.6	0.50	5.0
Martinsdale†	52	−13	24.1	0.32	3.1
Marysville†	51	− 2	22.9	2.12	27.4
Miles City					3.1
Poplar	60	−30	22.3	0.40	4.0
Radersburg†	50	2	29.8	2.50	25.0
Red Lodge†	47	− 8	21.8	0.45	4.5
Sun River†[d]	58	−12	26.2	0.02	0.2
Toston	64	− 4	27.8		
Troy†	45	4	28.3	2.20	25.0
Utica†	55	−16	25.5	0.52	7.0
Virginia City†	46	− 3	30.8	1.28	14.5
White Sulphur Springs†	52	−12	24.8	1.10	11.0
Wibaux†	66	−11	24.2	0.14	0.2
Yale†	56	−18	25.6	0.32	3.2
Nebraska.					
Agee*[1]	55	− 4	27.4	T.	T.
Albion	56			0.10	1.0
Alliance				0.19	1.0
Amelia*[1]	54	1	29.6	0.01	0.1
Ansley†	59	0	28.3	0.10	1.0
Arapaho				0.00	
Arborville*[1]	55	2	29.9	T.	T.
Ashland *a*†	64	2	30.1	0.26	2.5
Ashland *b**[1]	65	2	30.5	0.05	0.5
Ashton	52	− 2	27.8	0.15	1.5
Auburn*†	57	− 2	31.5	0.56	2.5
Aurora*[1]	56	4	30.1	0.13	1.3
Bassett	66	− 6	27.2	T.	T.
Beatrice†	59	3	29.2		
Beaver City	60	4	31.3	0.13	2.0
Benkelman*[1]	68	0	29.1	T.	T.
Blue Hill*[1]	58	3	31.4	0.05	0.5
Bratton*[1]	58	2	28.8	0.55	2.5
Brokenbow*[1]	62	−10	29.8	0.05	0.5
Burchard*[1]	58	0	31.0	0.28	1.0
Burwell*[1]	60	− 2	27.3	0.12	1.1
Callaway†	65	− 8	27.3	0.03	1.0
Central City*[b]	50	3	30.8	0.30	2.0
Chester*[1]	58	2	29.9	0.05	0.5
Columbus†	57	0	30.1	T.	T.
Cornlea				T.	T.
Creighton*†	56	− 5	25.0	0.05	0.5
Crete	59	1	31.0	0.02	0.2
Culbertson				0.07	0.7
Curtis *a*†	60	3	29.4	0.10	1.0
David City*†	52	0	27.9	0.75	1.0
Divide*[1]	56	2	30.1	0.04	1.0
Dunning*[1]	62	− 2	30.0	0.30	3.0
Edgar*[1]	58	2	30.0	0.10	1.0
Ericson†	55	− 1	28.2	0.10	1.0
Ewing†				0.10	1.0
Fairbury†	60	3	30.8	0.05	0.5
Fairmont*[1]	58	3	31.3	0.02	0.2
Fort Robinson	56	− 8	28.8	0.20	2.0
Franklin†	60	− 2	28.0	0.05	0.5
Geneva†	58	3	29.4	0.08	0.8
Genoa†	56	0	27.6	0.13	0.5
Gering†	58	− 4	24.6	0.09	0.9
Gibbon	54	0	29.7	T.	T.
Gothenburg	58	3	33.2	0.14	2.0
Grand Island *a**[1]	59	3	32.7	0.75	T.
Grand Island *b*	56	3	29.1	0.10	1.0
Greeley				0.00	
Haigler*[1]	66	− 7	28.0	0.40	4.0
Hartington†	53	− 6	23.1	T.	T.
Harvard*[1]	57	1	28.3	0.06	0.6
Hastings*[1]	54	− 2	26.3	0.22	2.0
Hayes Center†				0.25	2.5
Hay Springs†	52	−12	24.1	0.30	3.1
Hebron†	60	3	30.8	0.06	0.5
Hickman*[b]	62	2	31.6	0.00	
Imperial *a*†	65	− 4	27.4	0.40	4.0
Indianola*[b]	65	5	31.4	0.15	1.5
Kearney*[1]	60	0	29.3	0.10	1.0
Kennedy†	63	− 7	26.6	T.	T.
Kimball†	60	− 3	26.0	0.60	6.0
Kirkwood*[1]	64	− 5	26.0	0.05	0.5
Lexington†	58	− 7	29.6	0.50	2.5
Lincoln	60	2	30.3	0.05	0.3
Loup *a*	54	0	30.3	0.05	0.5
Lynch*†[1]	61	− 5	26.3	T.	0.1
Lyons				0.05	0.5
McCook*[1]	56	8	32.4	0.10	1.0
McCool				0.10	
Madison*[1]	55	− 2	24.8	0.02	0.2
Madrid*[b]	65[b]	0[c]	26.8[b]	0.20	2.0
Marquette*	54	2		0.22	2.2
Milford				0.05	0.5
Minden*[1]	58	0	29.3	0.33	2.5
Nebraska City *b*[1]	60	6	31.7	0.30	0.8
Nemaha City*[1]	58	2	29.2	0.60	4.0
Nesbit†	64	0	27.7	0.03	1.0
Norfolk†	58	− 5	26.7	T.	T.
North Loup†	54	0	28.0	0.05	0.5
North Platte					1.4
Oakdale†	55	− 3	25.8	0.01	0.1
Odell*[b]	60	2	30.7	0.23	T.
Omaha*[1]	54[f]	2	28.0[e]	0.25	0.2
Omaha (W. B.)					1.5
O'Neill*[1]	53	− 4	25.8	0.10	1.0
Ord	57	2	31.5	0.07	1.5
Osceola				T.	T.
Ough†				0.40	4.0
Palmer *a*[1]	54	0	26.1	0.20	2.0
Palmer *b*				0.10	1.0
Plattsmouth†				0.25	0.2
Potter*[1]	52	− 3	24.6	0.60	6.0
Ravenna *a*	54	2	29.5	0.18	1.8
Ravenna *b*[1]	55	6	31.9		
Red Cloud *a*				0.17	2.0
Red Cloud *b*[1]	56	4	30.2	0.09	1.8
Republican*[1]	60	2	30.6	0.12	1.2
Rulo*[1]	60	5	32.7	1.34	7.0
St. Paul	56	0	30.0	0.05	0.5
Salem*[1]	60	6	31.8	0.42	4.2
Santee Agency†	58	− 6	26.2	0.01	0.2
Schuyler				0.11	1.1
Seneca*[1]	58	− 7	26.6	0.16	1.6
Seward*[b]	62	3	31.4	0.05	0.5
Spencer	54	− 3	28.2	0.02	0.2
Springfield*[1]	58	0	28.8	0.26	1.0
Springview	62	− 4	27.1	T.	T.
Stanton*[1]	51	− 4	26.6	T.	T.
State Farm	61	2	30.2		
Strang*[1]	60	2	31.4	0.10	1.0
Stratton				0.17	
Superior*[b]	60	0	33.2	0.90	T.
Syracuse				T.	T.
Tecumseh *a*†	59	0	29.6	0.26	0.5
Tecumseh *b*				0.33	
Tekamah	56	− 5	26.1	0.05	
Thedford*[1]	62	− 4	27.4	0.35	3.5
Turlington†	59	− 4	27.2	0.37	1.6
Wakefield				0.07	0.8
Weeping Water*[1]	56	− 4	25.6	0.15	1.2
Whitman				0.05	0.5
Wilber*[1]	62	4	31.9	T.	T.
Wilcox				0.46	5.5
Wilsonville*[1]	60	6	30.6	0.20	2.0
Woodlawn				0.10	T.
York*[1]	58	2	32.7	T.	T.
Nevada.					
Austin	53	0	27.0	1.00	10.3
Battle Mountain*[1]	53	− 8	27.2	0.92	6.2
Belmont	57	− 6	24.8	0.24	2.8
Beowawe*[1]	50	−15	24.0	0.60	6.0
Candelaria	72	7	35.1	0.15	1.8
Carlin*[1]	60	−30	17.8	0.50	5.0
Carson City	65	1	32.6	1.38	10.1
Carson City (W. B.)					9.7
Cloverdale				0.30	3.0
Clover Valley†				0.80	8.0
Cortez†				1.60	16.0
Cranes Ranch				1.08	13.0
Currant				0.20	2.0
Darrough Ranch				0.13	1.3
Downeyville	65	6	34.8	0.24	0.4
Elko*[b]	45	−20	21.4	0.90	9.0
Elko (near)	52	−29	20.0	1.00	10.0
Ely	50	−11	22.2	0.20	2.0
Empire Ranch†	59	−20	25.2	0.25	3.0
Fenelon*[1]	46	−10	20.4	1.05	10.5
Genoa	60	− 2	32.0	0.72	0.7
Golconda*[1]	52	− 8	26.1	0.70	7.0
Gold Hill	65	12	34.1	1.15	14.5
Halleck*[1]	50	−31	20.2	1.04	10.5
Hamilton	78	−16	26.0	1.26	12.5
Hawthorne *a*[b]	62	19	35.1	0.20	2.0
Hawthorne *b*	64	11	35.0	0.20	2.0
Hot Springs*[1]	64	10	34.1	0.20	2.0
Humboldt*[1]	67	−17	28.2	0.40	4.0
Keysers Springs				0.01	0.1
Las Vegas	59	14	35.6	0.00	
Lewers Ranch	66	5	34.2	3.07	13.8
Lovelock*[1]	68	− 2	33.7	0.55	5.5
Mill City*[1]	55	−10	26.8		1.0
Osceola†	56	− 4	28.4	0.30	3.0
Palisade*[1]	48	−12	29.8	0.80	8.0
Palmetto	63	−11	27.4	T.	T.
Reese River				1.02	10.2
Reno*[b]	54	8	32.2	0.65	5.0
Reno State University	63	2	31.2	0.83	6.2
Ruby Valley†				1.64	13.0
St. Clair	61	6	29.8	0.20	1.3
St. Thomas	70	10	39.2	0.00	
San Antonio	65[d]	− 2[d]	27.0[d]	0.01	0.0
Silverpeak	76	− 8	29.1	0.30	3.0
Stofiel	46	−34	17.0	2.52	19.0
Tecoma*[1]	40	3	23.7	0.32	3.2
Toano*[1]	48	−15	21.0	0.85	8.5
Tuscarora*[1]	58	−10	28.1	0.95	9.1
Tybo	50	− 2	25.4	0.21	3.0
Verdi*[1]	60	0	31.4	2.47	9.5
Wadsworth*[1]	60	2	26.0	1.10	0.5
Wells	44	−26	21.6	0.92	9.2
Winnemucca					10.3
New Hampshire.					
Alstead*[b]	47	−14	25.0	3.20	6.5
Belmont				4.48	
Berlin Mills	58	−20	23.6	4.48	3.5
Bethlehem	58	−11	24.3	4.06	9.0
Brookline*[1]	60	0	34.7	4.09	8.0
Concord	58	−13	28.8	4.01	9.0
Dublin	62	− 2	30.2	4.43	11.0
Durham	71	0	30.6	2.76	4.0
Grafton†	60	−16	25.1	4.14	3.0
Hanover	56	−12	26.5	3.05	3.2
Keene	59	−15	26.6	3.10	5.5
Lakeport				4.31	
Mine Falls				2.75	
Nashua	62	− 4	29.0	3.16	8.5
Newton	61	0	30.4	2.32	4.0
North Conway	57	−14	27.2	6.88	3.0
Pennichuck Station				2.66	
Peterboro	60	−22	26.4	3.58	8.1
Plymouth	56	−14	26.5	5.52	4.5
Sanbornton†	57	− 9	26.3	3.30	4.0
Stratford	60	−16	26.5	3.40	4.0
Weirs Bridge				3.78	
West Milan	64	−21	21.6	3.96	5.5
Wolfboro				3.50	
New Jersey.					
Allaire	62	11	37.2		
Asbury Park	58	16	38.2	2.43	T.
Barnegat	66	17	40.7	1.71	1.5
Bayonne	63	13	37.0	2.36	1.2
Beachhaven	57	20	38.8	2.80	T.
Belvidere	67	6	34.4	3.32	
Beverly†	70	12	38.6	2.00	0.8
Billingsport	65	15	36.5	2.68	
Blairstown	64	13	39.0		
Boonton	60	8	34.8		T.
Bridgeton	66	17	40.6	1.92	T.
Camden	65	13	37.7	2.04	0.8
Cape May	62	20	39.8	2.33	T.
Cape May C. H.†	63	17	40.4	2.43	1.5
Charlotteburg	60	6	33.8	3.89	
Chester	58	6	34.2	3.60	
Deckertown	69	3	33.8	3.28	
Dover	62	8	33.2	2.98	
Egg Harbor City	63	12	37.7	2.79	T.
Elizabeth†	62	9	35.6	3.07	T.
Englewood	60	10	34.6	5.42	0.2
Franklin Furnace	60[i]	21[i]	40.2[i]	3.28	
Freehold	64	11	37.4	3.39	
Friesburg				1.72	0.5
Gillette	66	7	36.0	2.97	0.5
Hammonton				2.75	T.
Hanover	60	9	34.8	2.54	T.
Hightstown	64	12	36.8	2.52	T.
Imlaystown	65	13	39.2	2.17	1.6
Junction				2.44	0.1
Millville	66	14	40.2	2.35	T.
Moorestown	76	12	38.5	2.20	1.0
Newark *a*	58	12	36.8	2.92	0.5
Newark *b*†	59	12	36.8	2.67	0.6
New Brunswick *a*	64	10	37.3	2.68	0.8
New Brunswick *b*	64	12	36.6	2.57	0.8
New Brunswick (W. B.)					0.8
Newton	60	3	34.2	2.48	
Ocean City	59	17	38.8	2.88	
Oceanic	59	21	39.5	2.24	1.0
Paterson	62	13	37.4	3.77	T.
Perth Amboy	63	12	36.4	2.68	1.0
Plainfield	64	10	37.2	2.62	0.8
Rancocas*	67	12		1.91	1.2
Readington*[b]	64	16	40.1		

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
New Jersey—Cont'd.	°	°	°	*Ins.*	*Ins.*
River Vale	62	6	34.5	3.41	
Somerville	64	6	35.6	2.37	
South Orange	62	12	35.9	2.66	T.
Toms River	65	10	38.2	2.55	
Trenton	68	14	40.6	2.00	0.1
Vineland	65	14	39.0	2.22	T.
Whiting	66	18	40.2	2.51	1.0
Woodbine	64	12	37.6	2.97	T.
New Mexico.					
Albert†	67	10	37.2	0.20	2.0
Albuquerque†	58	5	31.9	0.32	3.0
Alma†	62	4	35.6	0.48	
Aztec†	51	— 3	24.2	T.	T.
Bernalillo†	56	7	31.5	0.21	0.3
Chama†	68	—20	23.6	2.90	29.0
Deming*[3]	71	16	42.9	0.15	
East Las Vegas	64	— 7	31.3	0.82	9.8
Eddy†	73			0.04	T.
Engle†	60	0	33.7	T.	
Espanola†	58	—12	26.1	0.81	8.0
Estalina Springs†				0.21	2.3
Fort Bayard	65	5	37.4	0.30	2.0
Fort Union†	65	1	32.0	0.40	6.5
Fort Wingate	68	— 8	29.4	2.30	22.0
Galisteo†	61	1	31.0	0.30	3.0
Gallinas Spring†	64	—10	33.8	0.29	6.0
Gila	66	10	38.5	0.42	T.
Hillsboro†	68	1	35.2	0.17	
Las Cruces†	68	1	37.4	0.32	
Lordsburg*[3]	55	14	36.6	0.10	
Los Lunas†	59	— 3	29.3	0.10	
Monero†	50	—21	20.2	1.02	11.5
Ocate†	60	—18	28.4	1.14	11.5
Olio†	45	— 4	19.5	T.	T.
Pecos				0.92	
Puerto de Luna†	65	5	37.0	0.35	3.5
Raton†	72	—12	28.8	0.60	6.0
Rincon†	62	2	35.9	0.10	T.
Roswell†	73	0	40.5	0.07	0.7
San Marcial†	58	2	33.6	0.00	
Santa Fe					12.7
Springer	72	— 21	39.9		
Sulphur Hot Springs†	44	— 17	17.3	1.23	18.0
Taos†	60	— 23	22.3	1.60	15.0
New York.					
Addison	62	2	32.7	2.92	0.5
Akron				3.70	
Albany					T.
Alfred	57	— 4	29.9	4.03	8.5
Angelica†	59	— 4	30.1	4.02	4.0
Appleton	64	— 2	31.5	3.71	3.4
Arcade	56	— 2	28.9	3.92	4.8
Atlanta				3.22	
Avon	61	— 2	30.6	2.58	T.
Baldwinsville	62	— 2	30.8	5.39	15.0
Bedford	62	10	35.6	3.06	
Big Sandy*[10]	60	— 6	28.8		
Binghamton†	63	— 1	31.4	3.63	T.
Bloomville	58	— 2	29.0	3.48	0.5
Bolivar				4.08	
Boyds Corners				4.85	
Brentwood	65	8	35.4	2.45	1.5
Brookfield	56	—12	28.6	4.73	6.0
Brooklyn	59	14	36.8	2.55	1.0
Buffalo					9.1
Canton†	61	—13	24.6[c]	6.31	3.7
Carmel	59	4	32.7	4.62	
Charlotte*[10]	60	0	32.5		
Cherry Creek				4.97	
Cooperstown†	60	— 2	29.0	3.89	1.0
Cortland	60	— 7	30.2	3.86	
De Kalb Junction				5.38	
Demster				4.82	
Deposit				2.60	
Easton				2.01	
Elmira†	62	4	33.4	2.70	0.5
Fleming	64	2	32.8	3.36	
Fort Niagara†	64	6	32.2	3.63	
Friendship	61	— 5	28.4[c]	3.35	2.9
Fulton				2.70	
Glens Falls	58	— 4	27.3	3.73	1.2
Gloversville	64	— 5	28.0	2.91	0.6
Hamilton	60	—12	28.4	3.54	5.0
Haskinville				3.13	
Honeymead Brook	59	0	30.4	3.30	T.
Humphrey†	59	3	31.4	2.82	6.9
Ithaca	62	— 2	33.0	4.07	3.1
Jamestown	58	— 6	29.0	4.52	9.2
Kings Station				4.12	
Lebanon Springs	58	— 8	29.4	4.48	3.0
Lowville	58	—15	27.1	4.94	5.0
Lyons	62	3	32.9	3.74	4.0
Madison Barracks†	67	— 9	30.2	2.96	1.4
Malone	59	—10	25.6	4.22	9.2
Manhattan Beach†				1.37	1.2
Middletown	56	2	32.0	1.68	
Mount Morris	64	0	32.1	2.50	T.
Newark Valley				2.43	
New Lisbon	60	— 6	28.6	4.04	1.5
New York					T.
North Hammond†	60	—10	27.8	4.72	3.0
Number Four†	55	— 8	25.6	5.32	11.4
Ogdensburg	65	— 8	28.1	5.90	4.2
Oneonta	62	— 2	32.7	3.87	
Oswego					4.1
Oxford	59	— 5	29.6	4.23	2.0
Palermo†	64	— 4	29.4	6.01	3.0
Perry City	60	— 5	29.3	3.08	3.8
Phœnix				4.49	
Pine City				3.28	
Pittsford	64	1	33.0	3.41	
Plattsburg Barracks	55	—10	24.4	2.40	T.
Port Jervis	60	3	31.6	3.33	0.0
Potsdam	60	—15	25.2	2.69	3.0
Poughkeepsie	64	1	32.9	2.92	
Ridgeway				3.18	
Rochester					8.7
Rome	59	— 4	29.2	4.15	
Romulus	63	— 2	32.7	3.11	T.
Rose†				5.00	
Saranac Lake	59	—18	22.9	3.49	7.8
Setauket†	62	16	38.6	2.48	1.2
Sherwood				4.57	
Skaneateles				3.92	
South Canisteo	61	— 3	30.8	4.34	3.6
Southeast Reservoir				4.12	
South Kortright†	59	— 4	28.4	3.23	
Turin	56	— 7	26.3	4.28	4.2
Tyrone				2.85	
Varysburg	61	— 6	30.6	4.72	13.3
Victor	69[e]	— 1[e]	31.7[e]	1.58	3.5
Wappingers Falls	64	1	33.3	3.37	T.
Warwick				2.21	
Waverly†	64	— 4	33.0	3.71	T.
Wedgwood	61	— 2	30.2	3.51	1.0
West Point†	58	3	32.2	4.20	
Willets Point	59	15	35.4	2.31	
North Carolina.					
Asheville†	63	8	38.4	3.78	13.8
Bryson City†				3.87	3.0
Chapel Hill†	72	18	42.6	3.63	T.
Charlotte					0.5
Experimental Farm	70	20	44.2		T.
Fair Bluff†				2.09	T.
Falkland*[1]	72	21	44.1	3.46	T.
Fayetteville†	73	21	44.3	2.30	T.
Greensboro†	68	18	42.8	4.37	
Greenville				2.25	
Henderson†	71	17	42.4	2.62	4.0
Highlands	58	6	34.7	5.64	3.0
Horse Cove†	60	13	38.5	5.63	5.0
Kittyhawk					T.
Lenoir*†[1]	62	13	39.0	3.85	2.0
Linville†	56	5	35.6	8.94	9.0
Littleton†	70	11	41.7	2.46	2.0
Louisburg†	74	16	39.6[b]	2.34[b]	[b]1.0
Lumberton†	74	18	44.4		
Lynn*†[2]	70		39.8	3.46	
Mocksville†	67	15	43.1	3.67	T.
Moncure†	74	19	42.0	2.78	2.0
Morganton*†[1]	68	18	38.2	3.32	
Mount Airy†	65[e]	13[b]	38.4[e]	4.09	3.2
Mount Pleasant	70	14	42.5	4.24	T.
Murphy†				4.23	6.5
Newbern†	76	22	47.7	2.10	0.5
Oak Ridge†	70	15	41.8	4.84	1.7
Pantego				3.06	0.2
Pittsboro	70	17	40.6	4.10	1.0
Raleigh*†[1]	70	19	45.4		
Raleigh (W. B.)					T.
Rockingham†	74	18	45.0	6.19	T.
Roxboro†	69	15	41.2	2.55	0.8
Rutherfordton†	59	12	38.0	1.06	T.
Salem†	61	14	37.1	4.32	
Salisbury	69	17	40.8	3.96	0.0
Saxon†	67	10	38.2	3.84	4.0
Selma	72	20	43.8	3.15	T.
Settle				6.98	0.8
Skyuka	62	20	40.5	3.68	T.
Sloan†	75	19	46.5	2.09	
Soapstone Mount†	75	11	41.6	5.49	0.5
Southern Pines*†[1]	74	22	47.5	3.54	
Southport†	72	21	49.4	2.28	0.0
Spring Hope*[1]	67	20	42.2	2.10	T.
Tarboro	73	18	44.0	2.79	0.0
Waynesville†	67	5	38.2	3.30	4.4
Weldon†	69	20	43.0	2.65	T.
Willeyton	70	21	45.2	2.28	1.8
North Dakota.					
Amenia	42	—17	13.2	0.08	1.2
Ashley†	44	—22	17.0	0.22	2.2
Berlin†	42	—20	14.0	0.85	8.0
Bismarck					2.9
Churchs Ferry	44	—22	12.4	0.42	4.2
Coal Harbor†	41	—16	14.4	0.55	5.5
Dickinson†	47	—15	18.0	0.50	5.0
Ellendale[k]	40	—18	19.6	0.40	4.0
Falconer	49	—25	15.9	0.30	2.0
Fargo†	42	—18	12.2	0.10	1.0
Forman†	41	—22	13.8	0.04	0.3
Fort Berthold†	62	—18	20.8	0.27	2.7
Fort Yates†	56	—12	20.8	T.	T.
Gallatin†	42	—20	13.2	0.18	1.8
Grafton†	38	—17	9.8	0.14	1.4
Jamestown†	41	—14	16.2	0.30	3.0
Kelso†	45[e]	—26[e]	11.6[e]	0.15	1.5
Lakota†	45	—18	9.4		
Lemert[f]	45	—23	9.4	T.	T.
McKinney	42	—18	13.2	0.24	2.4
Milton†	43	—20	8.0	0.60	6.0
Minto	39	—19	10.2	0.12	1.2
Napoleon†	40	—21	15.4	0.55	5.5
New England City†	46	— 3	17.5		
Oakdale†	55	—11	19.6	0.05	0.5
Portal†	39	—23	10.4		
Power†	45	—19	14.0	0.18	1.0
St. John†	47	—15	14.0	0.45	4.5
Steele†	41	—32	13.5	0.28	3.0
University†	41	—14	12.8	0.34	2.5
Wahpeton	42	—15	17.2	0.06	0.8
White Earth	60	—21	9.4	0.88	8.8
Wild Rice†[2]			12.6	0.18	1.8
Williston					6.4
Willow City†	41	—28	10.6	0.03	0.3
Woodbridge†	48	—20	9.8	0.40	4.0
Ohio.					
Akron	62	8	32.8	4.93	13.0
Annapolis	65	8	33.4		15.0
Ashland	61	6	31.7	4.20	8.3
Ashtabula	62	4	34.2	3.82	6.0
Atwater				4.85	7.0
Auburn	60	— 1	30.0	5.00	4.8
Bangorville	60	4	33.3	4.80	8.5
Basil				4.99	3.0
Bellefontaine	62	6	31.4	3.57	6.4
Bement*[1]	58	— 4	28.9	5.39	20.0
Benton Ridge	62	5	32.4	3.46	16.5
Bethany	62	11	34.9	2.62	1.0
Bigprairie	61	1	31.2	4.49	11.0
Binola	57	0	33.0	3.84	14.8
Bissells	56	4	31.4	4.46	16.2
Bladensburg	62	— 7	32.6	4.32	4.0
Bloomingburg	65	10	36.4	2.73	1.0
Bowling Green	62	— 2	31.0	3.74	11.0
Bucyrus	62	4	32.4	4.20	14.4
Cambridge		— 4		4.08	5.8
Camp Dennison	64	11	36.5	3.06	7.0
Canal Dover	63	—10	32.4	5.42	11.0
Canton†	62	— 1	33.2	4.91	7.4
Cardington	61	— 2	31.7	3.50	9.8
Carrollton	59	— 6	32.4	4.51	7.0
Cedarville				4.08	3.0
Celina	64	12	36.8	2.18	12.0
Cherry Fork	65	5	36.0	3.83	2.0
Cincinnati					6.8
Circleville[b]	64	10	36.6	3.86	1.5
Clarksville	63	10	35.9	3.38	3.2
Cleveland (V. O.)	62	10	34.1	4.16	12.5
Cleveland (W. B.)					9.9
Clifton	62	12	34.8	2.87	4.7
Coalton	79	0	35.2	2.84	4.0
Colebrook	60	0	32.4	4.43	5.0
Columbus					3.4
Dayton[a]	63	14	37.0	3.40	4.5
Dayton[b]†				3.16	
Defiance	60	0	31.4	5.38	17.1
Demos	67	7	34.8	4.77	7.0
Dupont	62	0	30.8	3.89	27.0
Ellsworth	60	2	32.4	4.56	4.9
Elyria	60	2	32.6	4.30	9.3
Fairport Harbor*[10]	60	6	34.4		
Fayetteville	64	10	35.4	3.98	5.8
Findlay	62	0	32.2	2.92	11.0
Fostoria	65	6	31.6	3.44	17.0
Frankfort	66	12	37.3	3.70	1.0
Garrettsville	61	— 3	32.0	4.68	10.3
Granville	62	9	34.8	5.29	3.0
Gratiot	61	— 3	34.2	4.40	9.3
Greenfield	63	12	37.4	3.40	3.0
Greenhill	61	— 9	31.4	4.26	7.8
Greenville	60	9	33.4	3.28	9.0
Hackney	66	11	34.7	3.66	7.0
Hanging Rock	78	6	37.0	2.43	T.
Hebbardsville	69	9	38.0	3.29	1.0
Hedges	59	— 6	29.9	4.21	20.0
Hillhouse	61	0	32.1	4.33	12.5
Hillsboro	64	7	36.1	3.49	1.0
Hiram	60	6	31.3	4.84	11.0

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Ohio—Cont'd.	°	°	°	*Ins.*	*Ins.*
Jacksonboro	63	11	33.9	3.30	4.0
Kenton†	62	7	33.6	4.09	16.4
Killbuck	60	4	32.5	4.18	4.5
Lancaster	64	13	33.6	3.87	3.2
Leipsic	62	1	31.4	3.59	12.5
Levering	59	0	31.0	4.26	2.6
Logan	66	8	35.2	3.78	2.0
Lordstown	61	3	32.4	4.51	7.5
McArthur	70	4	35.2	3.74	T.
McConnelsville	67	6	34.8	4.05	5.0
Marietta *a*†				3.22	3.0
Marietta *b*	66°	11°	37.8°	2.55	2.3
Marion	61	4	33.9	2.74	11.1
Medina	61	— 4	32.5	4.15	10.0
Milfordton	60	2	32.0	3.42	7.0
Milligan	65	— 5	34.6	2.90	5.0
Millport	62			4.08	7.0
Montpelier	56	—10	28.1	5.57	15.5
Napoleon	60	— 2	30.5	4.42	16.0
New Alexandria	63	4	34.1	5.50	9.5
New Berlin	60	0	31.2	4.04	8.5
New Bremen	60	9	34.6	4.05	10.5
New Comerstown	64	— 9	33.2	4.42	6.0
New Holland	64	10	35.5	2.91	2.2
New Moscow				4.11	9.9
New Paris	60	7	33.1	4.12	11.0
New Waterford				5.50	2.0
North Lewisburg	63	6	33.2	3.80	4.5
North Royalton	64	0	32.2	3.79	9.0
Norwalk	62	— 4	32.6	4.05	11.5
Oberlin	65	— 1	32.5	2.15	12.5
Ohio State University	62	11	34.8	4.29	3.8
Orangeville	60	4	32.1	4.15	3.0
Ottawa	63	4	32.1	4.05	18.5
Pataskala	61	0	31.8	4.68	5.4
Philo	68	9	34.4	3.36	4.6
Plattsburg	60	10	34.3	2.88	3.0
Pomeroy	66	10	35.2	2.38	0.8
Portsmouth *a*†				2.65	
Portsmouth *b*	70	14	39.9	2.62	1.3
Richwood				3.97	5.5
Ridgeville Corners	59	— 7	30.0	4.44	14.0
Ripley	65	9	37.0	4.04	3.1
Rittman	61	— 4	31.6	3.38	5.5
Rockyridge				4.46	10.7
Rosewood	63	10	33.4	3.00	3.5
Sandusky					7.9
Sharon Center	61	13	32.4	3.41	4.5
Shenandoah	60	1	31.0	3.32	5.0
Sidney *b*	62	9	33.6	3.48	11.4
Sinking Spring	68°	11°	36.2°	4.30	3.0
Springboro				2.66	
Stoutsville				3.80	1.0
Sylvania	60	— 5	29.9	5.48	11.0
Thurman	69	10	37.8	1.65	5.5
Tiffin†	63	8	33.0	4.50	11.0
Toledo					23.5
Upper Sandusky	61	6	32.8	4.85	12.0
Urbana	61	11	33.4	2.68	4.7
Vanceburg	70	8	38.4	3.43	1.2
Van Wert	61	2	31.2	3.25	17.5
Vermilion	61	2	32.2	4.55	22.0
Vickery	63	4	32.6	4.02	14.7
Walnut				3.72	1.8
Warren	64	3	33.6	5.82	12.5
Warsaw	76°	—13°	21.0°	3.98	7.2
Wauseon	58	— 5	29.0	6.72	22.0
Waverly	67	8	36.4	3.24	2.0
Waynesville				3.25	2.5
Wellington	62	10	35.2	3.00	2.0
Westerville	62	4	35.7	4.08	5.6
Willoughby				4.06	4.8
Wooster *a*	61	— 2	32.8	3.51	8.2
Youngstown	58	3	32.3	3.46	4.5
Oklahoma.					
Alva†	65	9	35.1	0.65	0.5
Anadarko†	72	9	40.8	2.50	5.0
Arapaho†	67	8	36.4	1.25	3.1
Britton				2.57	T.
Burnett†	69	12	40.8	7.66	2.5
Clifton†	70	11	37.9	4.84	4.0
Fort Reno†	68	10	38.4	2.50	4.0
Fort Sill	72	14	40.8	2.01	2.0
Guthrie†	67	11	40.0	2.88	3.0
Hennessey†				2.99	
Keokuk Falls†	68	11	40.6	10.75	2.0
Mangum†	73	12	40.8	0.92	6.0
Norman†[4]	69	12	39.0	3.87	T.
Oklahoma					5.0
Ponca†	66	10	35.6	2.70	1.0
Pondcreek†	65	11	34.2	1.35	
Prudence†				2.80	7.5
Sac and Fox Agency†	68	9	40.0	8.85	3.0
Stillwater†	66	13	38.1	3.38	0.5
Woodward†	69	8	36.5	1.11	6.5
Oregon.					
Albany *a*†	63	28	42.4	14.02	2.0
Arlington†	58	16	37.1	1.52	6.3
Ashland *b*	61	7	36.2	4.65	15.9
Astoria					1.0
Aurora[8]	60	33	44.0	10.35	
Aurora (near)	58	28	40.6	10.87	T.
Baker City					13.8
Bandon	61	32	46.8	21.67	
Beulah†	46	— 6	24.2	1.60	16.0
Brownsville[8]	66	27	42.6	10.40	
Canyon City†	63	8	37.3	1.15	11.5
Cascade Locks	56	27	38.7	19.60	
Comstock[8]	65	28	42.4	13.13	
Corvallis *a*	62	27	40.0	11.21	2.5
Corvallis (near)	60	25	40.5	14.98	
Crook	50	— 7	27.7	1.10	13.2
Dayville†	67[1]	7	36.3[4]	0.59	3.3
Detroit†	49	20	33.6	18.67	32.0
Eugene†	66	29	42.6	10.47	T.
Fife†	54	— 3	27.4	1.25	9.5
Forest Grove	55	27	39.1	14.76	6.0
Gardiner	67	31	46.4	30.99	
Glenora	55	21	37.8	30.14	19.3
Grants Pass *a*†	56	23	39.3	6.00	2.8
Happy Valley†	59	—11	26.6	2.08	13.2
Heppner	66[b]	15[b]	37.0[b]	2.71	8.0
Hood River (near)	58	30	34.2	12.83	51.0
Hubbard	58	28	40.0	11.92	
Irvington*	57	29		8.05	
Jacksonville	56	30	36.6	6.12	9.5
Joseph†	46	3	25.0	1.76	17.1
Junction City[8]	70	30	43.0	11.13	1.0
Lafayette[8]	60	30	44.4	9.31	4.5
Lakeview†	52	—13	24.6	2.25	16.0
Langlois	68	30	49.3	21.14	
Lorella	60	—17	30.0	5.90	19.0
McMinnville *a*†	57	26	39.7	15.43	1.8
McMinnville *b*[8]	56	30	39.0	11.96	1.5
Merlin[8]	54	22	37.2	7.05	12.0
Monmouth[8]	58	29	41.3	12.00	2.0
Mount Angel†	60	28	40.4	12.01	0.2
Nehalem				25.10	
Newberg	58	28	41.8[4]	14.24	3.0
New Bridge	52	5	30.8	2.30	23.0
Newport	64	27	44.6	19.86	
Pendleton	58	8	37.0	1.74	6.9
Portland					1.1
Riddles[8]	62	22	38.3	8.80	11.0
Roseburg					4.2
Salem *a*[8]	64	38	48.9	8.59	
Salem *b*†	65	29	42.2	11.16	
Salmon	61	7	30.2	22.04	130.0
Sheridan[8]	59	30	42.7	13.62	6.0
Silverton[8]	60	28	43.4	10.67	
Siskiyou[8]	58	18	33.4	4.90	49.0
Sparta	46	3	26.1	5.34	60.0
Springfield[8]	56	25	38.9	10.40	
The Dalles†	57	18	36.6	4.15	18.0
Tillamook Rock L. H.				7.36	T.
Toledo	60	25	44.6	11.01	
Vale	55	—10	26.2		
West Fork[8]	60	26	41.8	12.55	11.5
Weston	62	9	33.8	1.65	17.0
Williams	60	20	39.2	6.91	17.0
Pennsylvania.					
Altoona	60	7	37.6	2.50	
Aqueduct	63	3	33.9	4.15	1.0
Beaver Dam†				2.15	3.0
Bethlehem				2.61	
Brookville†				3.56	
Browers Lock				2.94	
Cameron				2.99	
Carlisle	51	4	33.6	3.49	1.0
Cassandra	56	— 2	33.8	3.68	13.0
Cedar Run				3.35	
Center Hall†				3.94	3.6
Chambersburg†	61	— 3	33.6	1.44	2.0
Coatesville	63	11	35.2	2.98	0.6
Confluence†				2.58	5.0
Coopersburg	63	10	36.8	3.22	0.3
Davis Island Dam†				2.91	
Doylestown				1.40	
Drifton	57[f]	6[f]	28.0[f]	2.07	1.8
Driftwood				3.86	
Dubois†				3.73	4.8
Duncannon				3.67	0.5
Dyberry†	60	— 4	30.2	3.02	0.5
East Bloomsburg				3.87	T.
East Mauch Chunk	61	6	33.2	5.72	0.5
Easton	62	7	35.9	2.47	T.
Edinboro[8]	58	0	30.8		21.0
Ellwood Junction†				3.33	2.0
Emporium	60	2	33.2	3.37	T.
Erie					10.1
Farrandsville				3.60	
Forks of Neshaminy[4]	64	16	39.2	2.56	
Pennsylvania—Cont'd.					
Frederick				2.66	
Freeport†				3.27	2.0
Gettysburg†	63	0	33.4	2.37	1.0
Girardville				4.65	0.2
Grampian	56	— 2	29.2	3.48	5.0
Greensboro†				2.83	
Hamburg	62	11	36.8	3.78	
Harrisburg					0.5
Hollidaysburg	60	—10	32.4	3.00	2.0
Honesdale	61	— 1	31.4	3.24	T.
Huntingdon *a*†	62	— 4	34.2	2.99	1.5
Huntingdon *b*				2.84	1.2
Johnstown†				3.22	4.0
Karthaus				2.10	
Keating				3.04	T.
Kennett Square	64	11	37.0	3.12	0.5
Lancaster[4]	69	10	36.0	1.02	
Lansdale				1.60	
Lebanon	64	9	35.4	4.14	0.5
Le Roy†	60	0	30.2	4.05	1.0
Lewisburg	66	— 1	33.8	4.09	1.5
Lock Haven *a*†	62	— 1	34.6	3.46	1.0
Lock Haven *b*				2.88	
Lock No. 4†				3.14	3.0
Lycippus	65	15[j]	36.4°	2.70	4.8
Mifflin				4.00	2.0
Nisbet				2.78	1.0
Oil City†				5.32	9.1
Ottsville				3.53	
Parker†				4.30	6.0
Philadelphia *a*				1.86	
Philadelphia *b*	65	18	39.6	2.05	0.5
Philadelphia *c*	68	11	39.2	1.41	T.
Philadelphia (W. B.)					0.5
Pittsburg					3.1
Point Pleasant				1.76	
Pottstown	63	13	37.6	3.20	0.5
Quakertown	62	8	34.7	3.19	T.
Reading[2]			34.8	3.59	
Renovo				3.33	
Ridgway†				3.00	1.8
Saegerstown	61	— 5	30.8	4.44	7.0
Salem Corners	62	1	30.9	3.88	0.5
Scranton	67	5	32.2	3.32	
Seisholtzville				3.59	
Selinsgrove	62	1	32.4	3.06	1.5
Shinglehouse	70	— 6	32.6	3.80	2.0
Sinnamahoning				2.97	
Smethport	58	0	31.4	3.85	1.5
Smiths Corners				2.56	
Somerset	67	— 5	33.0	2.89	6.8
South Bethlehem	62	10	39.0		
South Eaton	62	5	33.7	4.26	T.
Spruce Creek				3.44	
State College	60	— 1	33.1	2.75	0.4
Sunbury				2.77	1.0
Swarthmore	65	12	36.3	3.20	0.5
Towanda	63	1	32.4	3.57	0.2
Uniontown	69	14	37.6	3.87	2.5
Warren†				2.61	5.0
Waterville				3.82	
Wellsboro *a*†	60	— 6	29.8	6.55	1.0
West Chester	62	9	37.4	3.13	1.0
West Newton†				3.18	4.0
Westtown	62	11	37.2	2.68	1.0
White Haven	59	6	31.8	5.39	T.
Wilkesbarre†	64	17	34.8	4.13	
Williamsport	61	3	33.4	2.35	1.0
York†	63	10	35.0	3.33	1.0
Rhode Island.					
Block Island					6.9
Bristol	57	10	35.1	3.10	5.0
Kingston	57	8	33.6	2.45	6.0
Lonsdale				2.54	4.0
Narragansett Pier					4.0
Pawtucket	57	13	35.3	2.01	6.0
Providence *a*	60	10	36.4	2.78	5.0
Providence *c*	59	8	34.8	2.82	5.0
South Carolina.					
Anderson†				3.94	
Blackville†	73	15	44.8	2.89	
Camden†				2.94	T.
Central†	69	13	41.4	1.25	
Cheraw *a*†	74	18	44.6	3.41	
Cheraw *b*†				4.19	T.
Conway†				1.88	T.
Darlington (near)				2.87	
Edisto				2.69	
Effingham†				2.62	T.
Florence†	74	21	45.0	2.38	T.
Georgetown†	72	24	48.2	3.80	
Gillisonville†	79	13	47.2	1.64	
Greenville†	68	14	43.0	4.54	T.
Greenwood†				4.49	
Holland†[f]	72	20	43.3	6.55	
Kingstree *a*†	75	24	48.6	1.74	

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
South Carolina—Cont'd.	°	°	°	*Ins.*	*Ins.*
Kingstree δ†				1.80	T.
Little Mountain	76	21	48.2	4.41	
Longshore†	73	16	43.2	4.09	T.
Mount Carmel†				4.41	
Pinopolis *[1]	76	24	46.6	1.69	
Port Royal†	71	26	50.8	1.36	
Ridgeway†	70	20	45.8	2.27	T.
St. George†	74	18	46.6	2.02	
St. Matthews†	73	18	47.2	1.83	T.
St. Stephens†				1.93	
Santuck†	70	16	42.5	4.38	T.
Shaws Fork *[1]	80	23	49.6	3.50	
Society Hill†	73	21	45.3	3.26	
Spartanburg† *[5]	68	14	42.0	2.35	
Statesburg†	72	23	46.6	2.71	
Trenton	71	23	47.9	3.26	T.
Trial†	77	16	49.3	1.40	
Yemassee†	73	18	47.9	2.03	
Yorkville	71	18	45.0	4.75	0.5
South Dakota.					
Aberdeen†	46	−20	19.5	0.20	1.0
Alexandria†	51	−13	20.2	T.	T.
Ashcroft†	57	−18	24.6	0.05	0.5
Brookings†	46	−18	20.1	0.03	0.5
Buffalo Gap *[1]	64	− 4	30.4	0.15	3.0
Castlewood†	42	−22	16.6	0.10	1.0
Clark†	43	−18	17.8	0.50	5.0
Cross†	62	−10	27.0	0.08	1.4
De Smet†	58	−18	18.1		
Edgemont				0.10	1.0
Farmingdale				0.02	0.5
Faulkton†	53	−14	21.2	0.04	0.5
Flandreau†	39	−16	17.6	0.05	0.8
Forestburg†	51	−13	21.8	0.07	0.7
Forest City†	58	−10	24.6	0.00	
Fort Meade	69	1	32.3	0.40	6.0
Gary†	45	−10	19.4	0.16	1.5
Goudyville *† [2]	54	−13	17.4	T.	T.
Greenwood	61	− 2	27.6	0.02	0.3
Highmore†	57	−13[3]	23.2[3]	0.00	
Hotch City†	62	−11	26.0	0.05	0.5
Howard†	46	−14	19.5	0.10	1.0
Huron					2.0
Kimball†	54	−10	24.6	0.02	0.2
Leslie†	64	−12	25.1	T.	T.
Millbank†	43	−12	17.6	0.00	
Mitchell†	67	−11	24.2	0.05	0.4
Northville *[1]	48	−16	20.2	T.	T.
Nowlin†	68	−13	23.9	T.	T.
Oelrichs†	55	−14	29.2	1.10	11.0
Parker†	45	−14	21.1	0.02	0.2
Parkston	58	−10	23.8	0.00	
Pierre					0.1
Plankinton†	60	−10	25.3	T.	T.
Rapid City					1.3
Rochford				0.74	7.6
Rosebud	62	−14	25.6	0.30	3.0
Silver City				0.20	
Sioux Falls†	42	−11	19.4	0.05	0.5
Tyndall†	61	− 6	27.6	T.	T.
Vermillion	54	− 8	24.8	T.	T.
Watertown†	46	−23	16.3	T.	T.
Webster†	42	−25	15.2	1.43	7.4
Wentworth†	43	−14	19.4	0.03	0.3
Wessington Springs†	56	− 9	24.6	0.07	2.0
Yankton†	56	− 5	25.6	0.05	
Tennessee.					
Andersonville *[1]	65	13	40.4	2.95	3.2
Ashwood *† [1]	65	18	41.8	4.44	T.
Bluff City†				2.20	5.0
Bolivar†	68	18	43.6	3.79	0.2
Bristol†	65	8	37.7	1.59	3.2
Byrdstown†	69	8	40.1	5.42	4.2
Carthage†				5.32	0.7
Charleston†				2.98	
Charlotte†	70	22	40.8	3.64	2.0
Chattanooga					1.7
Clarksville†	70	14	41.0	5.08	3.2
Clinton†				3.74	2.0
Covington†	68	21	45.1	4.02	2.8
Decatur†	66	10	41.1	3.52	1.1
Dyersburg†	66	16	42.1	3.76	5.8
Elizabethton†				1.95	3.2
Fairmount *[1]	62[3]	14	37.0[3]	3.46	0.9
Florence†	68	12	42.6	5.38	0.8
Franklin†	69	10	40.7	5.42	4.5
Greeneville†	68	8	39.4	3.05	6.5
Hohenwald *† [3]		14	37.5	5.08	1.0
Jackson†	68	18	41.4	3.20	
Johnsonville†	71	15	42.3	4.41	0.5
Kingston				3.54	0.8
Knoxville					2.7
Loudon†				3.71	0.8
Lynnville *[1]	67	18	41.4	5.46	T.
McKenzie *† [1]	68	14	41.0	2.40	1.0
McMinnville†	68	14	42.2	4.27	0.8
Tennessee—Cont'd.					
Memphis					1.4
Mount Carmel *[2]	65[3]	20	40.4	4.80	2.0
Nashville					1.3
Newport *[3]	72	8	37.0	2.74	
Nunnelly *[1]	70	16	42.0	4.55	1.7
Palmetto†	77	16	44.4	5.41	
Riddleton†	65	8	40.8	5.16	2.0
Rockwood†				3.86	
Rogersville				2.11[b]	[b]1.8
Rugby *[1]	63	2	37.8	5.04	6.5
St. Joseph†	74	12	42.4	6.40	T.
Sewanee†	62	11	40.0	3.57	0.5
Springdale *[1]	72	9	41.6	3.07	10.0
Strawberry Plains†				3.31	2.8
Trenton	64	15	40.7	3.95	2.0
Tullahoma†	66	14	41.8	7.35	4.0
Union City	68	12	40.8	4.99	8.0
Waynesboro *[1]	78	16	41.8	4.42	0.5
Texas.					
Abilene					1.5
Albany *† [1]	68	23	42.5	3.20	T.
Alice† [4]	88	28	58.7	0.00	
Amarillo					7.5
Angleton	80	28	56.3	3.60	
Arthur City†				5.13	
Aurora *[1]	74	16	46.5	3.35	2.0
Austin *a* †	79	28	52.0	2.05	
Austin δ *[5]	74	24	53.4		
Ballinger†	74	18	46.9	2.93	
Beeville†	78	26	55.0	0.45	
Boerne *† [1]	71	27	50.3	0.81	
Brady†	76[3]	19	46.0	1.91	T.
Brazoria†	79	28	55.8	4.49	
Brenham†	76	28	52.6	1.71	
Burnet *† [1]	77	23	51.4	1.30	
Camp Eagle Pass†	82	16	51.9	0.00	
Chillicothe	74	15	46.9	0.32	3.2
Coldwater	74	0	36.4	0.80	8.0
Coleman *[3]		20	44.8	1.42	T.
College Station	75	26	52.6	2.18	
Columbia†	77	28	52.8	2.69	
Corsicana *a* †	75[4]	23[4]	50.2[4]	3.01	
Corsicana δ†	73	18	47.2	3.41	
Cuero†	77	28	54.0	0.97	
Dallas†	75	18	45.8	3.17	T.
Dean†	76	2	37.4	0.10	1.0
Dublin†	73	20	45.4	1.35	T.
Duval *[1]	78	26	52.3	1.25	
El Paso					0.1
Estelle†	72	19	46.2	2.53	T.
Flower Bluff†	75	26	58.0	0.10	
Forestburg†	70	16	40.4	2.41	T.
Fort Brown†	85	32	61.4	0.72	
Fort Clark	74	18	51.1	0.19	
Fort McIntosh	80	23	53.3	0.00	
Fort Ringgold†	83	20	55.9	0.00	
Fort Stockton†				0.56	T.
Fredericksburg *† [1]	73[3]	24	47.6[4]	1.51	
Georgetown *[1]	77	24	48.0	1.48	
Golindo				3.10	
Goree *† [1]	74	18	42.2	1.54	0.5
Graham†	76	17	43.6	3.46	
Grape Vine†	71	20	48.3	2.24	1.0
Hale Center†	74	13	44.2	0.17	1.7
Hallettsville†	77	26	53.4	1.08	
Happy†	72	3	35.8	0.25	2.5
Haskell†	68	19	43.1	2.12	1.5
Henrietta	74	17	42.9	4.48	2.0
Hewitt				2.15	
Houston†	76	29	53.5	1.77	
Huntsville†	74	26	50.3	2.70	
Kent				0.58	
Kerrville†	72	20	46.6	1.55	
Lampasas†	76	22	50.9	1.19	
Leakey†	78	18	51.2	0.92	
Llano *† [5]	74	27	50.2	0.75	
Longview†	73	24	48.4	3.26	
Luling†	75	25	52.3	1.32	
Marshall†	69	24	49.1	6.10	
Menardville *† [1]	77	19	46.2	1.21	
Midland†	83	10	47.6	1.00	T.
Mount Blanco † [1]	74[3]	11	38.6	T.	T.
New Braunfels†	73	27	51.4	1.06	
Orange†	72	28	50.2	3.07	
Palestine					T.
Paris†	71	19	44.3	5.25	
Roby†				1.29	0.2
Rockport *[1]	74	30	55.7		
Rock Springs†	73	16	46.8	0.69	
Runge†	85	25	57.3	0.86	
San Antonio	76	29	54.9	0.40	
San Marcos *a*†				1.27	
San Marcos δ	73[b]	30[b]	53.0[b]	1.83	
Sierra Blanca†	68	19	49.2	0.45	T.
Stafford†	78	26	53.5	2.00	
Sulphur Springs *† [1]	76	26	46.5	5.21	T.
Texas—Cont'd.					
Temple†	73	24	48.0	2.41	
Twohig† [3]	64	27	46.7	0.10	
Tyler†	70	20	45.8	3.23	
Waco†	74	25	49.5	2.03	
Weatherford†	73	20	46.3	2.15	T.
Wichita Falls†	66	14	39.8	2.93	2.0
Utah.					
Blue Creek *[6]	48	0	29.4	0.25	2.5
Castlegate†	56	− 1[d]	23.8[b]	0.80	8.0
Cisco†	51	− 2	24.2	T.	0.1
Corinne *[3]	48	− 5	24.6	0.70	7.0
Deseret†	48[c]	− 6[d]	20.8[c]	0.38	
Fillmore†	50	− 4	25.1	1.10	
Fort Duchesne†	29	−24	2.4	0.31	3.1
Giles	56	− 2	23.3	T.	
Grover†	56	− 4	22.9	T.	T.
Huntsville†				1.54	16.0
Kelton *[3]	46	0	31.9	0.15	1.5
Koosharem	52	−10	20.4	0.10	
Levan†	47	− 7	21.2	0.95	9.5
Loa†	54	−14	19.2		
Logan†	41	− 7	21.1	0.95	
Manti†	52	−14	20.8	0.70	7.0
Millville†				1.42	
Moab†	55	0	26.5	0.35	3.5
Moroni†				0.32	11.0
Mount Pleasant *† [1]	45	− 5	23.8	1.00	10.0
Ogden *a* [3]	40	4	26.6	0.85	8.5
Pahreah†	52	5	28.2	0.25	2.5
Parowan†	50	− 4	23.3	0.90	9.0
Promontory *[3]	38	−12	19.8	0.50	5.0
Provo City				1.37	13.5
St. George†	64	0	31.8	0.35	
Salt Lake City					8.1
Scipio†	50	−18	21.3	0.80	8.0
Snowville†	38	−12	20.0	0.50	5.0
Soldier Summit†	36	−16	13.8	1.65	16.5
Terrace *[3]	39	− 4	21.2	0.42	4.2
Thistle†	47	−15	14.2		
Vernal†	35	−12	12.2	0.27	3.1
Vermont.					
Brattleboro	58	− 6	29.0	3.80	7.5
Burlington†	58	− 5	29.0	1.74	4.0
Chelsea†	53	−10	23.0	3.78	3.0
Cornwall	57	− 4	27.8	2.05	
Enosburg Falls†	64	−20	25.4	4.29	4.0
Hartland†	56	−14	24.9	4.42	3.5
Irasburg†	53	−18	22.1	3.20	6.0
Jacksonville	54	− 8	26.2	4.72	4.0
Northfield					1.9
Norwich	55	− 9	27.3	3.95	3.0
St. Johnsbury	56	−15	23.4	3.82	2.5
Simonsville	57	−11	24.5	3.73	
Strafford *† [1]	49	− 5	25.3	5.11	4.0
Vernon *[3]	52	− 7	27.3	2.91	4.0
Wells	58	−12	26.9	3.20	4.0
Woodstock	57	−18	24.2	4.84	5.0
Virginia.					
Alexandria	66	10	37.0	0.58	0.6
Ashland†	76	12	39.4	1.78	4.2
Avon†	73	11	39.2	4.35	3.0
Bedford City†	65	16	38.0	3.83	4.0
Big Stone Gap†	68	22	32.6	3.35	7.3
Birdsnest *† [1]	71	25	43.0	3.30	3.2
Blacksburg	64	9	35.4	3.41	5.0
Buckingham†	71	5	36.6	1.77	1.8
Callaville†	68	18	41.2	2.31	0.5
Cape Henry					3.0
Charlottesville	70	8	39.7	3.51	3.5
Christiansburg†				1.97	3.1
Dale Enterprise†	69	− 1	34.0	2.76	2.0
Fredericksburg†	67	18	39.2	1.12	2.3
Hampton	66	21	43.8	3.08	5.0
Irwin†	68	8	37.2	1.25	3.0
Lexington†	68	10	37.5	2.93	2.4
Lynchburg					3.1
Manassas†	68	8	37.4	2.37	1.0
Marion†	66[d]	4[d]	36.9[d]	3.87	4.0
Monterey†	58	0	32.4	4.54	2.1
Norfolk					2.5
Nottoway	72	15	41.9	2.11	2.0
Petersburg†	70	16	40.4	2.13	4.0
Richmond (near)†	73	13	41.2	2.09	3.9
Rockymount†	69	15	41.6	3.70	2.3
Salem†	70	16	41.5	3.76	3.0
Saltville	68	8	37.2	2.78	4.2
Smithville†	67	15	39.1	1.12	4.2
Speers Ferry†				2.74	5.2
Spottsville†	69	18	40.4	2.45	3.9
Stanardsville†	67	7	37.0	3.72	3.0
Staunton†	70	3	37.2	3.34	2.6
Stephens City†	67	5	35.3	3.34	2.5
Sunbeam†	71	19	43.0	2.74	1.5
Warsaw†	67	14	40.0	2.80	6.0
Westbrook Farm	68	15	40.0		

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Washington.	°	°	°	*Ins.*	*Ins.*
Aberdeen†	55	26	41.2	21.08	2.0
Anacortes	.....	.....	.....	6.12	8.5
Ashford	.....	.....	.....	13.10	24.0
Blaine†	61	9	36.4	6.88	13.8
Cascade Tunnel†	48[1]	11[1]	29.6[1]	16.50[e]	165.0
Centerville†	62	11	36.0	4.06	21.0
Colfax†	52	8	32.0	3.22	26.8
Connell†	66	10	44.6	.....	.....
Conpeville†	61	21	41.6	2.81	2.2
East Clallam	.....	.....	.....	.....	11.0
East Sound†	60	19	41.7	6.73	4.0
Ellensburg†	47	— 8	26.6	2.25	.....
Ellensburg (near)	48	— 2	28.4	2.38	21.0
Fort Canby	.....	.....	.....	.....	T.
Fort Simcoe	54	10	33.6	2.81	15.5
Fort Spokane	49	— 1	28.8	1.36	7.5
Grand Mound†	56	18	39.2	13.09	0.7
Hunters†	45	— 5	22.3	1.45	13.9
Lakeside†	53	11	31.8	2.25	15.5
Lapush†	56	27	43.6	15.76	3.2
Madrone*†	59	23	40.6	9.49	7.0
Mayfield†	56	22	38.2	12.02	4.0
Monte Cristo†	62	18	35.2	28.14	198.0
Moxee Valley†	59	— 8	31.8	0.42	2.1
Neah Bay	.....	.....	.....	.....	1.5
New Whatcom†	64	17	41.7	4.26	2.0
Olga†	57	22	41.2	6.97	2.5
Olympia†*	59	23	40.8	14.96	2.0
Pine Hill†	52	17	36.1	9.27	52.5
Pomeroy†	54	17	36.2	2.22	15.5
Port Angeles	.....	.....	.....	.....	3.4
Port Crescent	.....	.....	.....	.....	0.8
Pullman†	49	4	30.3	3.22	28.0
Pysht	.....	.....	.....	.....	5.0
Rosalia†	53	8	28.8	2.22	17.0
Seattle	.....	.....	.....	.....	3.5
Silver Creek*[1]	60	22	38.3	12.91	10.0
Snohomish†	63	24	40.8	7.44	6.2
Spokane	.....	.....	.....	.....	19.0
Stillaguamish†	59	19	37.0	4.15	2.5
Sunnyside†	61	— 7	33.8	0.78	8.0
Tacoma†	60	24	39.8	10.85	6.0
Tatoosh Island	.....	.....	.....	.....	T.
Union†	56	25	40.4	17.27	8.6
Vashon†	65	14	37.5	12.85	1.5
Walla Walla	.....	.....	.....	.....	8.2
Waterville†	48	6	26.6	2.75	17.0
Wenatchee Lake†	40	4	26.7	.....	103.5
West Ferndale†	60	18	40.6	5.46	5.0
West Virginia.					
Beverly†	70	12	35.8	2.99	6.5
Bloomery†	63	— 6	33.0	2.20	1.5
Bluefield†	72	5	37.0	3.27	6.5
Buckhannon *a*†	.....	.....	.....	2.68	5.5
Buckhannon *b*†	70	15	38.4	.....	.....
Charleston†	.....	.....	.....	2.69	.....
Dayton*[1]	63	16	37.6	.....	.....
Elkhorn†	68	9	39.7	2.98	9.2
Ella†	62	12	35.6	2.59	3.5
Fairmont†	.....	.....	.....	2.33	5.0
Glenville‡	96	16	36.8	3.24	6.0
Grafton†	70	13	36.1	2.23	6.8
Green Sulphur	72	12	38.4	0.75	0.1
Harpers Ferry†	.....	.....	.....	2.83	1.0
Hewett†	72	18	39.5	2.78	.....
Hinton *a*†	.....	.....	.....	2.01	.....
Hinton *b*†	67	14	39.4	.....	4.5
Leachtown†	.....	.....	.....	3.05	3.2
Marlinton†	65	— 3	32.4	4.14	9.6
Martinsburg†	65	— 2	35.2	3.05	3.0
Monarch*[1]	68	15	39.7	.....	8.5
Morgantown *a*†	.....	.....	.....	2.48	0.1
Morgantown *b*†	69	10	35.8	1.85	1.3
New Martinsville†	66	4	33.8	3.93	6.0
Nuttallburg†	68	11	36.9	1.87	1.0
Oldfields†/	68	0	36.5	2.58	1.0
Parkersburg	.....	.....	.....	.....	4.4
Pennsboro	70	6	38.7	3.80	7.0
Point Pleasant†	70	12	38.0	3.51	.....
Powellton†	64	11	34.6	2.91	6.5
Rowlesburg†	.....	.....	.....	2.75	11.0
Sandyville†	70	9	37.4	3.06	3.3
Spencer †	60	9	37.3	2.00	1.0
Tannery*[1]	64	14	35.8	.....	3.8
Weston *a*†	.....	.....	.....	2.70	7.0
Weston *b**†	70	18	38.1	2.70	8.0
Wheeling *a*†	.....	.....	.....	4.04	6.0
Wheeling *b*†	68	10	38.2	3.85	6.0
Wisconsin.					
Amherst	47	— 3	22.9	1.71	.....
Antigo †	60	— 9	19.6	1.07	4.5
Apollonia *†[1]	42	—12	21.8	1.04	6.0
Barron†	40	—30	19.4	1.66	8.5
Bayfield	42	1	21.0	1.40	14.0
Beloit	50	— 3	26.6	1.57	2.1
Black River Falls†	45	— 5	22.4	0.48	4.5
Boscobel†	52	1	25.8	2.05	T.
Butternut†	46	—26	18.0	2.03	15.5
Centralia	48	— 5	22.4	1.26	.....
Chilton	50	—15	22.4	1.50	5.5
City Point	.....	.....	.....	1.19	1.8
Crandon†	59	—18	23.7	1.60	9.0
Delavan†	59	— 9	25.6	2.23	1.5
Depere†	50	— 3	23.4	1.73	5.4
Eau Claire	45	—15	21.1	0.90	6.0
Florence†	40	—11	17.6	1.91	11.6
Fond du Lac†	49	— 5	22.8	1.44	3.5
Green Bay	.....	.....	.....	.....	4.2
Hartford	.....	.....	.....	1.96	4.0
Harvey†	52	— 7	25.0	1.92	2.4
Hayward†	42	—23	17.6	0.95	9.5
Hillsboro	50	— 3	24.4	2.05	T.
Koepenick*†[1]	44	—12	19.7	0.95	6.5
La Crosse	.....	.....	.....	.....	12.5
Lancaster†	50	— 2	24.0	1.94	2.8
Lincoln†[2]	.....	.....	26.6	0.78	6.8
Madison†	50	0	24.9	1.80	2.2
Manitowoc†	47	0	25.3	1.54	5.4
Meadow Valley†	43	— 5	22.3	2.17	.....
Medford†	46	—18	19.3	1.28	12.8
Milwaukee	.....	.....	.....	.....	3.1
Neillsville†	46	—16	21.5	1.40	5.0
New Holstein†	48	0	29.0	1.31	2.4
Oconomowoc†	53	— 9	26.1	1.25	1.0
Oconto	49	— 4	24.6	2.42	9.5
Osceola†	44	—16	18.2	0.16	1.2
Oshkosh†	51	— 1	25.7	1.00	5.0
Pepin	38	—14	18.3	0.31	8.0
Pine River†	48	— 8	23.4	1.96	7.1
Port Washington	57	— 4	28.0	1.55	2.0
Prairie du Chien	55	— 6	25.0	2.04	1.2
Racine*[10]	48	— 4	27.6	.....	.....
Royalton	45	— 5	22.8	2.48	8.0
Sharon†	53	— 6	24.6	3.44	T.
Shawano	48	— 5	23.4	1.70	5.0
Spooner†	47	—20	18.3	0.70	4.0
Stevens Point†	47	— 5	21.6	0.76	3.2
Sturgeon Bay Canal*[9]	40	0	26.2	.....	.....
Valley Junction†	50	— 6	22.8	1.30	0.2
Viroqua	50	— 2	23.6	2.05	1.0
Watertown†	50	— 7	25.5	2.05	4.5
Waukesha†	52	— 3	26.6	1.82	3.8
Waupaca*[1]	38	— 2	20.8	1.40	0.4
Wausau †	45	— 5	21.2	1.36	4.0
Wisconsin—Cont'd.	°	°	°	*Ins.*	*Ins.*
West Bend	46	— 2	24.4	1.40	3.2
Westfield†	48	— 6	23.4	1.75	2.5
Whitehall†	48	—22	20.2	1.30	6.0
Wyoming.					
Big Horn Ranch†	54	—11	22.0	0.08	0.7
Cheyenne	.....	.....	.....	.....	1.8
Embar†	70	—14	25.6	0.50	5.0
Fort Laramie†	60	— 5	27.0	0.30	0.4
Fort Washakie	48	—10	20.2	0.00	
Fort Yellowstone†	44	— 6	19.0	1.29	13.1
Lander (V. O.)	49	— 9	20.4	0.00	
Lander (W. B.)	.....	.....	.....	.....	T.
Laramie	45	—16	15.4	0.33	.....
Lusk†	51	—12	22.4	0.56	T.
Sheridan	53	—16	23.6	0.25	2.5
Sundance	48	—12	21.8	2.10	21.0
Wheatland†	58	0	29.6	0.70	7.0
Mexico.					
Ciudad P. Diaz	80	22	55.2	0.00	
Leon de Aldamas	75	34	56.8	0.04	
Mexico	75	36	55.8	0.00	
Puebla	76	38	57.9	0.00	
Topolobampo*[1]	85	50	63.7	0.00	
New Brunswick.					
St. John	54	— 2	28.7	4.10	7.2
West Indies.					
Grand Turk Island	.....	.....	.....	1.62	

EXPLANATION OF SIGNS.

* Extremes of temperature from observed readings of dry thermometer.

† Weather Bureau instruments.

‡ Record furnished by the Arrowhead Reservoir Company, in the San Bernardino Mountains, San Bernardino County, Cal., at elevations varying from 4,900 to 6,900 feet.

A numeral following the name of a station indicates the hours of observation from which the mean temperature was obtained, thus:

[1] Mean of 7 a. m. + 2 p. m. + 9 p. m. + 9 p. m. ÷ 4.

[2] Mean of 8 a. m. + 8 p. m. ÷ 2.

[3] Mean of 7 a. m. + 7 p. m. ÷ 2.

[4] Mean of 6 a. m. + 6 p. m. ÷ 2.

[5] Mean of 7 a. m. + 2 p. m. ÷ 2.

[6] Mean of readings at various hours reduced to true daily mean by special tables.

[7] Mean from hourly readings of thermograph.

[8] Mean of 7 a. m. + 2 p. m. + 9 p. m. ÷ 3.

[9] Mean of sunrise and noon.

[10] Mean of sunrise, noon, sunset, and midnight.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.

An italic letter following the name of a station, as "Livingston *a*," "Livingston *b*," indicates that two or more observers, as the case may be, are reporting from the same station. A small roman letter following the name of a station, or in figure columns, indicates the number of days missing from the record; for instance, "*e*" denotes 14 days missing.

No note is made of breaks in the continuity of temperature records when the same do not exceed two days. All known breaks, of whatever duration, in the precipitation record receive appropriate notice.

CORRECTIONS.

October REVIEW, 1895, Chart V, headline for "Horizontal Magnetic Force" read "Deflecting Magnetic Force." Page 379, "Notes by the Editor," "The Great Storm of October, 1896, in the Gulf of California" read "The Great Storm of October, 1895, in the Gulf of California."

TABLE III.—*Data from Canadian stations for the month of December*, 1895.

Stations.	Pressure.			Temperature.		Precipitation.		Prevailing direction of wind.	Total depth of snow.
	Mean not reduced.	Mean reduced.	Departure from normal.	Mean.	Departure from normal.	Total.	Departure from normal.		
	Inches.	*Inches.*	*Inches.*	°	°	*Inches*	*Inches.*		
St. Johns, N. F	29.80	29.95	+ .11	33.2	+ 2.8	5.40	.....	ne.	13.0
Sydney, C. B. I	29.96	30.02	+ .14	32.4	+ 3.4	5.24	+ 0.52	nw.	0.2
Halifax, N. S	29.96	30.10	+ .15	32.6	+ 4.1	5.86	+ 0.57	nw.	3.0
Grand Manan, N. B.	30.02	30.07	.....	31.4	.....	3.37	— 1.30	w.	7.6
Yarmouth, N. S.	29.99	30.07	+ .09	33.4	+ 1.9	4.23	— 1.04	n.	6.6
St. Andrews, N. B.	.....	.....	.....	28.0	.....	2.56	— 1.00	nw.	7.5
Charlottet'n, P. E. I.	30.00	30.04	.....	29.8	.....	2.53	— 1.47	w.	4.8
Chatham, N. B	30.05	30.07	+ .13	21.8	+ 5.3	4.42	+ 1.45	w.	15.8
Father Point, Que.	30.04	30.07	+ .12	19.4	+ 3.4	3.23	+ 1.01	s.	12.6
Quebec, Que	29.74	30.09	+ .08	20.0	+ 4.0	3.21	+ 1.10	ne.	8.2
Montreal, Que	29.86	30.08	+ .05	21.6	+ 2.1	3.33	— 0.23	s.	12.1
Rockliffe, Ont	29.80	30.04	+ .01	18.1	+ 3.6	3.20	+ 0.46	se.	33.8
Kingston, Ont	29.74	30.07	+ .02	27.3	+ 2.3	4.46	+ 0.82	ne.	6.0
Toronto, Ont	29.66	30.06	.00	29.4	+ 1.4	4.19	+ 1.65	w.	5.2
White River, Ont	28.55	29.99	.....	11.2	+ 2.4	2.30	+ 0.86	w.	16.2
Port Stanley, Ont	29.38	30.05	— .02	29.4	.....	5.04	+ 2.43	sw.	15.3

TABLE III.—*Data from Canadian stations*—Continued.

Stations.	Pressure.			Temperature.		Precipitation.		Prevailing direction of wind.	Total depth of snow.
	Mean not reduced.	Mean reduced.	Departure from normal.	Mean.	Departure from normal.	Total.	Departure from normal.		
	Inches.	*Inches.*	*Inches.*	°	°	*Inches*	*Inches.*		
Saugeen, Ont	29.26	30.01	— .01	28.6	+ 1.6	4.89	+ 0.76	e.	33.5
Parry Sound, Ont.	29.28	30.01	— .02	25.2	+ 4.2	7.24	+ 3.31	e.	44.5
Port Arthur, Ont	29.17	29.91	— .11	16.2	+ 5.7	0.96	— 0.11	w.	9.0
Winnipeg, Man	29.00	29.89	— .21	8.2	+ 5.0	1.75	+ 0.56	s.	17.0
Minnedosa, Man	27.91	29.85	— .25	8.1	+ 5.6	0.76	+ 0.03	nw.	7.6
Qu'Appelle, Assin.	27.46	29.88	— .24	8.8	+ 4.8	0.65	+ 0.01	nw.	6.5
Medicine Hat, Assin	27.48	29.90	— .20	20.4	+ 5.4	0.24	— 0.12	w.	2.4
Swift Curr't, Assin.	27.08	29.82	— .30	13.8	+ 2.8	0.56	— 0.15	w.	5.6
Calgary, Alberta	26.14	29.85	— .27	18.2	— 3.7	0.62	— 0.16	w.	6.2
Prince Albert, Sask.	28.26	29.90	.....	3.7	.....	0.76	.....	e.	....
Edmonton, Alberta.	27.40	29.88	— .14	14.9	+ 1.2	1.15	+ 0.75	sw.	11.5
Battleford, Sask	28.00	29.87	.....	6.5	.....	0.30	.....	nw.	2.8
Spences Br'ge, B. C.	29.10	29.96	.....	30.5	.....	0.93	.....	e.	5.0
Hamilton, Bermuda	29.92	30.08	— .04	65.6	.....	5.84	.....	n.	
Banff, Alberta	25.20	30.05	.....	16.9	.....	2.54	.....	sw.	....
Esquimalt, B. C	29.93	29.96	.....	39.9	.....	12.21	.....	sw.	8.5

TABLE IV.—*Mean temperature for each hour of seventy-fifth meridian time, December,* 1895.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Bismarck, N Dak	14.2	14.5	14.6	14.5	14.1	13.5	13.9	14.0	14.1	14.9	16.9	19.1	21.3	23.0	23.9	24.0	23.5	21.5	19.8	18.8	17.7	16.8	16.3	15.5	17.5
Boston, Mass	33.9	33.8	33.9	33.5	33.4	33.0	33.0	33.0	33.3	34.6	36.1	37.5	38.4	38.9	38.8	38.5	37.5	36.8	36.0	35.9	35.3	35.0	34.4	34.0	35.4
Buffalo N Y	33.2	32.9	32.7	32.6	32.4	32.6	32.9	33.2	33.7	34.3	35.5	36.0	36.5	36.4	36.7	36.3	35.5	35.1	34.6	34.5	34.2	33.9	33.5	33.4	34.3
Chicago, Ill	30.2	29.8	29.6	29.4	28.8	28.2	28.0	28.2	28.0	28.2	28.9	29.7	30.1	30.4	30.7	30.8	30.8	30.6	30.3	30.7	30.3	30.0	29.8	29.6	29.6
Cincinnati, Ohio	36.3	36.2	35.7	35.6	35.1	34.6	34.4	34.4	34.8	35.9	37.5	38.6	39.5	40.4	41.0	40.8	40.6	39.8	39.2	39.0	38.2	37.2	36.9	36.3	37.4
Cleveland, Ohio	32.1	32.1	32.1	31.5	31.4	31.0	31.2	31.2	31.3	32.4	33.5	35.6	36.5	37.1	36.9	36.7	36.0	35.4	34.8	34.2	33.9	33.1	32.5	32.0	33.5
Detroit, Mich	28.8	28.7	28.5	28.4	28.5	28.4	28.3	28.1	28.6	29.3	30.4	31.4	31.9	32.3	32.3	32.1	31.7	31.2	30.8	30.6	30.0	29.7	29.3	29.1	29.9
Dodge City, Kans	28.3	27.8	27.1	26.5	25.6	25.1	24.7	24.3	23.7	25.5	30.0	35.4	39.5	41.6	43.6	44.0	43.9	42.4	37.5	34.4	32.7	31.7	30.3	29.0	32.3
Eastport, Me	29.0	29.0	28.9	28.8	28.4	28.1	28.2	28.6	29.4	30.5	31.7	32.5	33.0	33.3	33.0	32.5	31.6	31.2	30.9	30.8	30.5	30.1	29.9	29.9	30.4
Galveston, Tex	54.9	54.5	54.4	54.2	54.2	53.9	53.6	53.3	52.7	52.9	54.0	55.0	56.5	57.7	58.2	58.3	58.3	57.7	56.9	56.3	55.8	55.5	55.0	54.6	55.4
Havre, Mont	21.7	20.9	20.8	21.0	21.3	21.2	20.3	20.4	19.6	19.3	19.7	21.3	24.1	26.2	27.9	28.5	28.3	27.0	25.0	23.7	23.8	22.6	22.6	22.4	22.9
Kansas City, Mo	32.5	32.5	31.9	31.5	31.0	30.4	29.8	29.9	29.1	29.9	31.5	33.1	34.0	35.3	36.1	36.8	37.1	36.3	35.4	34.7	34.0	33.5	32.8	32.3	33.0
Key West, Fla	67.4	67.1	67.0	66.7	66.6	66.5	66.5	66.9	67.5	68.2	68.5	68.9	69.2	69.3	69.3	69.4	68.8	67.8	67.5	67.5	67.2	67.1	67.1	66.9	67.7
Marquette, Mich	23.8	23.5	23.5	23.5	23.4	23.4	23.2	23.5	23.6	24.1	24.7	25.6	26.6	27.3	27.7	27.9	27.1	26.3	25.5	25.0	24.6	24.2	24.0	23.6	24.8
Memphis, Tenn	42.7	42.3	41.8	41.5	41.1	40.6	39.9	39.5	39.1	39.9	41.3	43.1	44.9	46.4	47.5	48.3	48.5	48.0	47.2	46.4	45.6	44.9	44.0	43.3	43.7
New Orleans, La	51.2	50.9	50.4	50.1	49.5	48.5	48.1	47.9	48.5	50.9	54.3	56.6	58.2	59.5	60.2	60.4	59.9	57.8	56.0	54.4	53.4	52.5	51.6	51.3	53.4
New York, N Y	35.0	34.6	34.4	34.1	33.9	33.8	33.7	33.6	34.5	35.2	36.2	37.6	38.6	39.7	39.8	39.8	39.4	38.8	38.2	37.7	36.9	36.5	36.0	35.5	36.4
Philadelphia, Pa	36.7	36.1	35.5	35.4	35.2	35.0	34.9	35.5	36.3	37.6	39.1	40.6	41.7	42.6	43.1	43.0	42.4	41.4	40.5	39.8	39.1	38.5	37.6	37.3	38.6
Pittsburg, Pa	35.9	35.7	35.3	34.8	34.7	34.6	34.9	35.1	35.6	36.7	38.2	39.6	40.8	41.4	41.7	41.3	40.7	39.9	39.1	38.5	38.2	37.5	36.7	36.0	37.6
Portland, Oreg	40.5	40.2	40.1	40.2	39.9	40.0	39.9	40.0	39.7	39.6	39.3	40.0	40.0	40.7	40.9	41.9	42.2	42.5	42.0	42.0	41.7	41.2	41.0	40.3	40.7
St. Louis, Mo	36.3	36.0	35.5	35.4	34.8	34.7	34.5	34.6	34.6	35.5	36.6	37.8	38.7	39.7	40.6	41.0	40.5	39.6	38.7	38.0	37.3	36.9	36.7	36.2	37.1
St. Paul, Minn	21.8	21.5	21.1	20.4	19.7	19.3	18.6	18.2	17.7	17.6	19.2	21.0	22.8	24.0	25.0	25.3	25.1	24.3	23.2	22.8	22.1	21.7	21.5	21.4	21.5
Salt Lake City, Utah	25.1	24.9	24.6	24.5	24.6	24.5	23.9	23.7	23.4	23.1	23.5	24.9	27.0	28.4	29.1	30.1	30.0	29.7	28.9	27.8	27.1	26.2	25.6	25.4	26.1
San Diego, Cal	51.7	51.3	50.4	50.2	49.6	49.5	48.9	49.2	48.5	48.3	51.5	55.7	59.1	61.5	63.0	63.3	66.2	62.5	61.4	59.4	57.3	55.2	53.5	49.1	54.8
San Francisco, Cal	48.5	48.0	47.7	47.1	46.9	46.6	46.1	45.5	45.4	45.3	46.1	47.0	48.0	48.7	50.1	51.0	52.0	52.6	52.0	50.9	50.2	49.8	49.1	48.7	48.5
Santa Fe, N. Mex	23.2	22.8	22.1	21.5	21.1	20.5	19.9	20.4	19.3	21.0	24.6	26.9	29.1	30.5	31.5	32.4	33.0	32.6	30.1	27.2	26.1	25.3	24.4	23.6	25.4
Savannah, Ga	46.2	45.5	45.2	44.6	43.8	43.6	43.5	44.7	47.5	51.5	54.6	56.9	58.6	59.5	59.6	58.8	55.9	53.7	52.3	51.1	49.8	48.8	48.0	46.8	50.4
Washington, D. C	36.0	35.5	35.1	34.5	34.3	34.0	33.7	34.1	35.7	38.0	40.0	41.5	42.7	44.1	44.8	44.3	43.2	41.7	40.6	39.5	38.5	37.9	37.1	36.6	38.5

TABLE V.—*Mean pressure for each hour of seventy-fifth meridian time, December,* 1895.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Bismarck, N. Dak	28.104	.097	.094	.098	.096	.092	.094	.094	.098	.104	.110	.109	.094	.078	.069	.074	.083	.093	.099	.095	.090	.085	.080	.078	.092
Boston, Mass	29.962	.966	.956	.948	.950	.957	.971	.985	.001	.004	.987	.971	.962	.958	.962	.964	.970	.976	.978	.973	.966	.963	.959	.947	.968
Buffalo, N. Y	29.296	.299	.303	.296	.298	.297	.308	.309	.314	.317	.307	.288	.271	.264	.265	.266	.267	.273	.278	.280	.281	.280	.282	.281	.288
Chicago, Ill	29.089	.082	.089	.085	.077	.079	.086	.093	.097	.105	.107	.099	.081	.071	.072	.076	.081	.086	.094	.100	.099	.099	.099	.094	.089
Cincinnati, Ohio	29.407	.403	.405	.401	.396	.397	.404	.407	.417	.425	.422	.401	.380	.366	.367	.373	.381	.393	.398	.404	.406	.408	.410	.409	.399
Cleveland, Ohio	29.251	.255	.257	.254	.250	.248	.248	.247	.252	.253	.249	.236	.203	.196	.200	.206	.211	.220	.228	.233	.232	.235	.238	.239	.235
Detroit, Mich	29.247	.245	.249	.245	.237	.235	.235	.236	.239	.245	.243	.227	.210	.202	.198	.204	.208	.217	.226	.232	.234	.238	.238	.238	.230
Dodge City, Kans	27.418	.413	.407	.412	.413	.407	.406	.412	.421	.428	.447	.452	.430	.401	.384	.376	.379	.381	.393	.402	.409	.414	.418	.421	.410
Eastport, Me	29.981	.979	.968	.963	.963	.969	.980	.992	.001	.996	.978	.966	.961	.953	.957	.970	.980	.992	.995	.995	.985	.980	.970	.960	.977
Galveston, Tex	30.113	.110	.110	.109	.109	.109	.123	.135	.152	.164	.168	.156	.132	.102	.090	.085	.085	.084	.098	.111	.124	.132	.138	.135	.120
Havre, Mont	27.240	.237	.233	.235	.241	.240	.240	.237	.243	.246	.253	.256	.249	.228	.207	.195	.193	.194	.196	.195	.198	.202	.205	.209	.224
Kansas City, Mo	29.010	.999	.005	.005	.003	.003	.014	.019	.028	.041	.051	.046	.017	.006	.985	.983	.988	.995	.005	.011	.016	.018	.022	.025	.012
Key West, Fla	30.099	.094	.089	.087	.085	.090	.102	.120	.137	.146	.141	.121	.096	.077	.071	.071	.077	.086	.096	.106	.114	.121	.120	.115	.103
Marquette, Mich	29.104	.100	.103	.097	.089	.087	.087	.087	.091	.102	.109	.107	.089	.085	.086	.097	.107	.115	.116	.113	.111	.111	.109	.103	.100
Memphis, Tenn	29.669	.666	.667	.669	.667	.665	.677	.686	.698	.711	.721	.708	.680	.654	.640	.635	.637	.641	.650	.661	.668	.670	.680	.679	.671
New Orleans, La	30.104	.102	.104	.103	.102	.110	.122	.133	.151	.162	.161	.143	.114	.089	.076	.072	.074	.078	.086	.103	.115	.120	.125	.119	.111
New York, N. Y	29.772	.774	.776	.776	.776	.789	.801	.816	.827	.830	.813	.793	.776	.709	.768	.770	.772	.777	.777	.775	.773	.769	.760	.757	.783
Philadelphia, Pa	30.004	.011	.013	.013	.016	.026	.038	.052	.065	.067	.051	.025	.010	.002	.997	.998	.000	.003	.005	.004	.999	.995	.995	.991	.016
Pittsburg, Pa	29.186	.189	.193	.190	.188	.190	.195	.199	.204	.209	.198	.177	.158	.148	.149	.148	.148	.155	.163	.165	.166	.169	.173	.174	.177
Portland, Oreg	29.942	.943	.937	.936	.940	.940	.926	.927	.934	.924	.929	.938	.947	.945	.935	.923	.918	.922	.923	.923	.928	.929	.936	.939	.932
St. Louis, Mo	29.421	.419	.423	.424	.417	.420	.428	.440	.447	.457	.461	.448	.428	.410	.403	.406	.411	.416	.424	.434	.435	.433	.433	.431	.428
St. Paul, Minn	29.026	.024	.032	.038	.035	.032	.035	.037	.041	.054	.065	.064	.047	.028	.019	.021	.024	.027	.031	.034	.033	.029	.027	.026	.035
Salt Lake City, Utah	25.779	.779	.773	.775	.779	.774	.768	.770	.773	.775	.786	.796	.796	.778	.758	.748	.747	.752	.757	.760	.766	.770	.775	.776	.771
San Diego, Cal	30.058	.056	(.51)	.047	.046	.043	.039	.040	.050	.063	.076	.089	.088	.072	.041	.021	.014	.012	.012	.018	.029	.035	.045	.051	.046
San Francisco, Cal	30.081	.085	.078	.074	.075	.074	.068	.066	.075	.082	.095	.107	.119	.111	.084	.067	.059	.056	.055	.058	.062	.066	.072	.077	.077
Santa Fe, N. Mex	28.253	.250	.244	.247	.248	.245	.242	.242	.247	.252	.263	.274	.272	.256	.238	.228	.225	.226	.227	.232	.239	.245	.254	.257	.246
Savannah, Ga	30.067	.071	.071	.065	.062	.068	.080	.089	.100	.109	.100	.071	.046	.030	.023	.021	.026	.034	.044	.055	.064	.071	.070	.068	.063
Washington, D. C	30.081	.096	.040	.040	.039	.048	.058	.069	.080	.084	.073	.048	.028	.012	.005	.002	.006	.008	.010	.012	.015	.019	.020	.017	.033

TABLE VI.—*Average wind movement for each hour of seventy-fifth meridian time, December, 1895.*

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Abilene, Tex.	9.8	9.5	9.5	8.9	9.4	9.8	10.1	10.1	9.3	9.1	11.1	12.0	13.3	13.5	13.9	14.0	13.4	12.3	8.8	7.6	7.7	8.8	9.6	9.3	10.4
Albany, N. Y.	7.5	7.4	7.6	7.7	6.6	6.4	6.6	7.3	7.7	8.9	9.5	9.9	10.3	10.7	10.3	10.0	9.4	8.9	8.6	8.2	8.4	8.1	8.4	7.8	8.4
Alpena, Mich.	9.2	9.5	9.2	9.3	8.7	8.9	8.9	9.1	9.1	9.3	9.9	10.9	10.6	10.5	10.2	10.0	9.5	9.3	9.4	9.4	9.3	9.7	9.7	9.4	9.5
Amarillo, Tex.	15.2	15.3	14.8	13.6	13.8	13.5	14.1	14.1	13.8	13.6	14.6	15.4	15.6	16.7	17.3	18.3	17.0	14.3	12.4	13.2	13.4	13.7	14.2	13.9	14.7
Atlanta, Ga.	11.5	11.6	11.5	10.7	10.7	10.6	10.8	10.2	10.5	11.6	12.0	12.0	12.4	12.2	12.0	12.8	12.8	11.4	11.1	11.9	11.9	12.1	12.4	12.1	11.6
Augusta, Ga.	4.1	4.2	4.2	3.5	4.2	4.3	4.0	4.0	4.4	5.5	6.0	6.4	7.5	8.8	8.7	9.2	8.3	7.0	6.2	5.9	4.9	4.8	4.7	4.9	5.7
Baker City, Oreg.	6.5	5.9	5.9	6.2	5.5	5.6	5.6	5.3	6.3	7.0	6.5	6.3	5.7	6.4	6.2	5.3	6.1	6.0	6.4	5.4	5.9	6.6	6.3	5.7	6.0
Baltimore, Md.	8.0	7.8	7.6	7.0	7.4	6.9	6.9	7.1	7.6	8.5	9.1	8.7	8.7	9.5	9.8	9.7	8.6	8.4	8.5	8.1	7.5	7.6	7.6	7.6	8.1
Bismarck, N. Dak.	9.7	9.5	9.7	9.3	10.3	9.0	9.3	9.6	9.5	8.4	9.7	10.0	11.8	13.4	14.3	13.0	12.0	10.9	9.5	8.8	9.8	9.8	9.2	9.4	10.2
Block Island, R. I.	21.1	21.0	21.0	21.1	20.2	20.9	21.1	21.3	21.2	21.2	20.8	20.6	19.8	20.3	20.4	19.0	18.8	19.1	20.2	20.7	20.8	21.1	20.4	20.6	20.5
Boston, Mass.	13.2	13.3	13.9	13.6	14.1	13.8	13.6	12.8	14.0	13.9	13.6	13.7	13.3	13.0	13.6	12.8	11.8	11.6	12.5	12.6	12.7	12.5	13.0	13.1	13.2
Buffalo, N. Y.	13.7	13.9	14.1	14.3	13.6	13.9	13.1	13.0	12.9	13.7	15.0	15.6	15.5	15.2	14.4	14.4	14.9	14.2	14.6	14.6	13.8	13.0	13.5	14.3	14.1
Cairo, Ill.	12.1	12.3	11.8	11.4	10.6	10.3	10.1	10.0	10.8	10.9	11.7	11.8	12.0	12.5	12.4	12.5	11.3	11.1	10.9	11.2	11.4	11.7	11.8	11.8	11.4
Cape Henry, Va.	15.8	15.9	15.8	16.1	16.2	16.4	16.5	15.7	15.0	15.5	15.7	15.5	15.2	14.2	13.4	13.1	13.2	12.9	13.7	13.6	13.9	14.1	14.9	15.2	14.9
Charleston, S. C.	6.9	6.9	7.3	7.4	7.3	7.7	7.5	7.9	7.9	8.4	8.2	8.7	8.6	8.8	9.2	8.8	8.4	7.0	6.7	7.3	7.4	7.8	8.1	7.6	7.8
Charlotte, N. C.	6.0	6.4	6.1	6.1	5.8	5.6	6.0	6.9	6.4	7.6	8.3	8.7	9.2	9.6	9.5	9.1	8.2	7.3	7.0	7.0	7.2	7.6	7.3	6.9	7.3
Chattanooga, Tenn.	7.4	7.5	6.8	6.5	6.5	6.8	6.7	6.6	6.7	7.1	7.9	9.4	10.3	11.0	11.3	11.2	10.8	9.4	8.8	7.5	8.2	8.4	8.9	8.8	8.4
Cheyenne, Wyo.	12.8	12.9	12.5	12.1	12.9	13.3	13.5	14.4	14.7	13.3	14.8	18.3	19.9	20.1	21.1	20.6	19.9	17.3	14.5	12.9	13.0	13.9	13.7	13.5	15.2
Chicago, Ill.	20.2	19.3	18.9	18.4	18.4	18.1	17.9	18.4	18.0	18.1	17.8	15.5	18.5	18.7	18.8	18.3	18.6	18.7	18.8	18.9	19.3	19.9	20.2	19.9	18.8
Cincinnati, Ohio.	6.5	6.4	7.1	6.8	7.3	7.4	7.7	7.9	8.2	8.3	8.9	9.5	10.1	10.1	9.7	9.7	8.9	8.6	8.5	7.9	8.1	7.9	7.3	6.9	8.1
Cleveland, Ohio.	13.5	13.4	13.7	13.5	13.8	14.2	14.7	15.5	15.5	16.1	17.0	17.3	17.9	18.1	16.8	16.1	14.7	13.9	13.9	14.1	14.7	15.2	14.9	14.2	15.1
Columbia, Mo.	9.8	9.5	9.5	9.9	9.5	8.8	8.3	8.2	8.7	9.0	10.1	11.2	12.1	12.1	12.1	12.1	11.6	10.7	10.2	9.9	10.2	9.9	10.0	9.8	10.1
Columbus, Ohio.	7.0	7.0	6.7	6.5	6.7	7.3	7.3	7.6	8.2	8.9	8.9	9.1	9.8	9.5	9.2	9.1	8.8	8.5	7.6	7.5	7.3	7.7	7.5	7.4	8.0
Concordia, Kans.	6.9	6.7	7.0	6.2	6.3	6.4	6.3	5.9	6.0	7.2	8.4	9.6	9.5	10.4	10.5	10.2	9.5	7.9	5.9	6.0	6.4	6.7	6.5	6.9	7.5
Corpus Christi, Tex.	11.3	11.5	11.0	11.1	11.0	10.1	9.2	9.2	9.6	10.2	10.6	11.8	12.0	13.0	13.2	13.5	13.5	12.9	11.4	9.7	9.9	9.9	9.9	10.2	11.1
Davenport, Iowa.	9.1	9.6	8.8	8.8	9.1	8.8	8.8	9.1	9.1	9.4	10.6	10.7	11.2	11.6	11.9	11.5	10.4	9.7	9.5	9.7	9.5	9.8	9.8	9.2	9.8
Denver, Colo.	8.2	7.6	8.5	8.6	9.6	9.0	9.8	10.2	10.6	10.5	10.1	9.3	8.4	11.0	11.5	10.7	11.1	11.5	11.2	10.1	9.2	9.8	9.7	9.2	9.8
Des Moines, Iowa.	7.4	7.3	7.0	7.5	7.4	7.5	7.4	7.5	7.7	8.4	9.1	9.2	9.9	10.0	10.0	9.9	9.3	8.7	8.2	8.0	7.8	7.6	8.0	7.8	8.3
Detroit, Mich.	11.0	10.9	11.3	11.0	11.4	11.6	11.3	11.4	11.2	12.4	12.5	13.5	13.8	13.4	13.1	12.4	12.1	11.6	11.2	11.1	11.6	12.0	11.5	11.3	11.9
Dodge City, Kans.	9.0	9.1	9.5	9.7	9.3	9.1	9.2	9.5	8.5	9.0	10.9	11.2	12.5	13.4	14.5	14.9	14.4	12.5	9.2	8.6	8.5	8.5	8.6	8.5	10.4
Duluth, Minn.	9.5	8.6	8.7	8.9	9.2	9.4	10.2	10.6	10.5	10.7	9.8	10.4	10.9	11.1	10.8	10.1	9.6	8.5	9.5	10.5	10.5	9.7	9.5	10.1	9.9
Eastport, Me.	13.9	14.0	13.9	14.7	14.5	15.0	14.5	15.1	15.4	15.5	16.4	16.2	15.8	15.3	14.8	13.9	13.4	15.4	15.2	15.3	15.9	15.9	14.3	14.4	15.0
El Paso, Tex.	10.2	9.4	9.6	9.4	8.8	9.0	8.7	9.0	9.4	8.6	9.8	10.3	11.0	11.3	12.4	13.7	14.0	12.4	10.8	10.4	11.1	10.7	10.1	8.7	10.4
Erie, Pa.	13.8	13.5	14.3	14.4	13.8	13.2	13.0	12.9	12.7	13.5	13.5	13.9	14.4	14.3	13.4	12.9	12.8	12.6	13.5	13.4	13.6	13.8	13.9	14.2	13.6
Eureka, Cal.	5.3	4.7	4.7	5.7	4.7	4.5	4.4	4.4	4.2	3.8	4.0	3.8	4.3	4.7	5.0	7.0	7.4	8.4	8.1	6.7	6.6	6.5	6.1	6.3	5.5
Fort Canby, Wash.	20.8	20.6	21.3	22.2	22.5	22.2	21.3	22.1	22.1	23.8	24.0	23.6	23.9	22.0	23.2	23.1	23.0	22.5	22.5	21.3	20.3	20.9	21.1	20.1	22.1
Fort Smith, Ark.	6.3	7.1	6.8	6.5	6.7	7.3	7.1	7.8	7.5	7.6	8.7	8.0	8.1	8.9	10.1	10.2	9.9	8.8	6.7	6.0	6.5	6.7	6.3	6.3	7.6
Fresno, Cal.	3.0	3.5	2.8	2.7	3.0	2.7	2.7	3.5	3.3	3.6	3.5	3.2	3.4	3.3	2.9	3.0	3.2	3.2	3.0	2.8	2.4	3.0	2.6	2.7	3.0
Galvestou, Tex.	12.1	12.3	11.8	12.2	12.0	11.8	12.1	12.2	12.2	13.2	13.2	11.9	11.9	11.8	11.6	11.7	12.4	12.1	11.3	11.1	11.8	12.5	12.8	12.3	12.1
Grand Haven, Mich.	11.3	11.5	11.9	11.9	11.7	11.1	10.7	11.5	11.3	12.3	12.4	12.4	12.8	12.1	12.1	11.7	11.1	10.5	10.4	10.9	10.8	10.9	11.5	11.9	11.5
Green Bay, Wis.	7.6	7.9	7.5	7.6	7.8	7.7	8.1	8.0	8.6	8.8	9.1	9.9	10.3	10.5	10.7	10.0	9.0	8.9	8.7	9.3	9.3	8.7	8.7	8.0	8.8
Hannibal, Mo.	9.6	9.3	9.2	9.5	10.1	9.8	9.5	9.5	9.0	9.9	11.0	12.0	12.8	12.6	12.6	12.3	11.6	10.2	9.6	9.6	9.9	9.9	10.2	10.0	10.4
Harrisburg, Pa.	6.6	6.5	7.0	6.8	7.6	6.7	7.2	7.0	6.3	7.1	7.4	8.3	8.4	8.7	8.3	7.8	7.9	7.6	6.8	6.7	6.5	7.0	6.2	6.8	7.2
Hatteras, N. C.	15.5	16.6	17.2	17.9	17.9	17.5	17.0	17.1	16.0	16.0	16.4	15.6	15.6	16.2	16.1	15.1	14.9	15.5	15.6	15.2	14.7	15.0	14.9	15.3	16.0
Havre, Mont.	12.2	13.5	13.0	13.4	13.7	13.9	13.8	13.4	12.6	12.5	12.1	11.8	13.1	15.3	16.0	16.5	16.1	14.9	13.1	12.8	12.4	13.1	12.9	13.1	13.6
Helena, Mont.	8.8	8.7	8.0	9.1	8.8	8.9	7.7	8.3	8.8	8.7	8.1	8.4	8.5	9.0	9.0	9.2	9.2	8.0	8.4	8.7	10.2	9.4	9.6	9.5	8.8
Huron, S. Dak.	11.9	12.7	12.4	12.8	12.7	12.6	11.8	11.8	11.5	12.8	14.0	14.8	15.7	17.5	18.1	17.9	17.0	14.6	13.1	13.4	14.2	14.4	14.0	13.2	13.9
Idaho Falls, Idaho.	7.6	7.2	6.2	6.0	6.0	6.4	6.2	5.7	5.5	6.1	6.7	6.8	6.5	7.8	7.5	8.7	8.6	8.9	8.3	7.4	8.0	8.2	7.6	7.5	7.2
Independence, Cal.	5.0	5.3	5.3	5.7	5.6	5.3	5.4	5.7	6.8	6.9	6.5	5.8	6.9	7.4	6.7	6.5	6.4	6.4	6.0	6.7	7.1	6.0	5.9	5.5	6.1
Indianapolis, Ind.	7.3	7.1	7.2	7.5	7.1	7.3	7.3	7.4	7.7	8.2	8.4	8.6	8.2	8.2	7.9	8.1	7.8	6.8	6.4	6.6	7.1	7.6	7.7	7.9	7.6
Jacksonville, Fla.	5.2	5.3	5.2	5.0	4.9	4.8	5.0	5.8	6.2	6.9	8.1	8.6	9.2	9.3	9.4	9.2	9.0	7.1	6.6	6.4	5.9	6.0	5.9	5.4	6.7
Jupiter, Fla.	10.8	10.7	10.6	10.7	10.2	9.4	9.8	9.7	10.9	12.0	13.4	13.4	13.1	13.5	12.6	12.6	12.0	10.8	10.4	10.5	11.1	11.0	11.0	10.6	11.3
Kansas City, Mo.	9.3	9.0	9.4	9.0	9.0	9.1	9.0	9.7	9.4	10.0	10.5	10.6	11.1	11.3	11.5	11.3	10.5	9.9	9.6	9.2	9.6	9.5	9.2	9.2	9.8
Keokuk, Iowa.	7.9	7.9	8.0	7.7	7.5	7.7	8.2	8.0	8.5	9.2	9.6	9.9	10.2	10.0	9.6	9.7	9.0	8.5	8.7	8.5	8.9	8.4	8.0	8.6	8.6
Key West, Fla.	11.9	12.7	12.6	12.4	12.5	12.7	12.0	12.1	12.5	13.0	13.9	14.0	13.5	14.1	14.5	14.2	14.1	13.7	13.6	14.2	14.4	14.0	13.5	13.0	13.3
Kittyhawk, N. C.	16.7	16.0	16.2	17.2	17.2	16.5	16.9	16.8	17.6	18.5	17.3	17.5	17.5	17.1	16.7	16.6	16.7	16.6	16.6	16.3	15.7	15.3	16.0	16.0	16.7
Knoxville, Tenn.	4.6	4.2	4.6	4.9	4.8	4.4	4.4	4.5	4.5	5.5	6.1	5.9	7.2	7.6	7.9	7.7	6.9	5.4	4.8	4.6	4.5	4.5	4.5	4.2	5.3
La Crosse, Wis.	6.5	6.9	7.3	7.5	7.4	7.1	7.1	7.1	7.0	7.4	7.5	7.5	8.1	8.2	7.9	8.3	8.4	7.5	7.6	7.5	6.8	7.0	6.9	6.4	7.4
Lander, Wyo.	3.5	3.4	3.1	3.2	2.8	2.8	2.5	3.1	3.2	3.0	3.5	3.5	4.7	5.5	5.9	5.5	6.3	5.9	4.6	5.4	4.6	3.7	3.9	3.8	4.1
Lexington, Ky.	13.3	13.3	13.8	13.5	13.6	14.4	14.0	14.5	14.4	14.2	14.9	15.4	16.4	16.4	17.2	15.0	14.0	13.3	13.3	13.2	13.2	13.5	13.4	13.4	14.2
Little Rock, Ark.	8.9	9.0	8.3	8.5	8.7	9.1	8.5	7.8	8.1	8.7	9.6	10.7	11.7	12.0	11.7	11.9	12.0	10.9	9.4	8.1	8.2	8.5	9.1	8.8	9.5
Los Angeles, Cal.	2.8	3.0	3.2	3.6	3.5	3.1	3.4	3.6	3.1	3.5	3.8	4.0	4.0	3.5	3.2	3.3	4.1	4.9	4.1	4.0	2.6	2.4	2.5	3.1	3.4
Louisville, Ky.	8.3	8.9	8.8	9.0	9.0	9.2	9.1	8.8	8.6	8.6	9.1	10.0	10.7	10.3	10.3	10.2	9.5	8.9	8.7	9.1	9.3	9.1	8.8	8.4	9.2
Lynchburg, Va.	3.7	3.2	3.1	3.1	3.1	3.0	2.8	3.1	3.5	4.1	4.2	4.9	5.9	6.2	6.4	5.8	5.1	4.9	4.8	4.2	4.0	3.5	3.9	3.4	4.2
Marquette, Mich.	12.1	12.2	11.3	10.5	10.1	10.4	10.8	11.0	11.5	12.1	13.1	13.7	13.4	12.8	12.6	12.7	11.4	10.3	10.1	11.0	12.3	13.2	12.6	12.9	11.8
Memphis, Tenn.	13.6	13.7	13.2	13.0	12.4	12.9	12.7	12.5	12.4	12.3	12.9	12.4	11.5	12.4	12.4	12.6	12.8	12.7	11.3	11.1	11.5	12.1	12.5	13.4	12.5
Meridian, Miss.	5.9	5.4	5.3	5.0	5.5	5.4	5.7	5.9	7.1	7.5	8.9	9.2	9.5	9.6	9.7	9.7	9.1	6.9	5.5	5.4	5.7	5.6	6.1	6.1	6.9
Miles City, Mont.	6.8	7.0	7.0	7.0	6.2	5.6	5.7	5.8	6.0	7.1	6.7	6.6	7.5	8.5	8.4	8.5	8.0	6.5	5.9	6.2	6.4	6.2	6.1	6.7	6.8
Milwaukee, Wis.	11.5	10.4	10.3	9.8	10.7	10.4	10.7	10.5	10.7	11.0	11.8	11.7	12.2	13.0	13.0	12.7	11.8	11.1	10.5	11.0	11.4	10.8	11.3	11.2	11.2
Mobile, Ala.	6.6	7.1	6.2	6.1	5.8	6.0	6.1	6.5	7.5	8.7	9.1	10.2	11.6	12.0	12.7	12.5	12.3	11.1	9.7	8.8	8.3	8.1	7.5	7.2	8.7
Montgomery, Ala.	6.7	6.3	6.1	5.5	5.7	5.5	5.5	5.5	6.0	7.1	8.3	9.1	9.4	10.0	10.5	9.8	9.3	7.3	6.8	7.3	7.5	7.4	7.5	7.4	7.4
Moorhead, Minn.	10.5	10.5	10.9	11.0	11.4	11.2	10.5	10.6	10.8	11.0	11.7	13.3	13.1	13.2	13.1	12.7	12.2	11.8	10.9	10.8	11.3	10.7	10.5	10.1	11.4
Nantucket, Mass.	15.3	15.2	14.8	14.0	14.1	14.6	14.6	13.6	13.6	15.0	16.1	16.1	16.2	15.1	15.2	14.9	15.1	15.0	14.7	14.9	15.2	15.3	15.0	15.3	14.9
Nashville, Tenn.	8.5	8.0	7.6	7.9	7.5	7.4	7.4	7.3	7.7	8.9	9.3	10.2	11.1	11.2	11.3	10.4	10.4	9.8	10.1	9.4	9.3	8.8	9.2	8.7	9.1
New Haven, Conn.	10.6	10.3	11.5	11.5	10.3	9.8	10.7	11.1	11.0	12.3	12.5	12.4	12.7	12.7	12.3	11.4	9.9	9.5	9.8	10.5	10.6	10.2	10.3	10.5	11.0
New Orleans, La.	8.4	8.8	8.5	9.1	9.4	9.4	9.4	9.7	10.2	11.1	11.6	13.3	14.0	14.0	13.4	13.0	12.9	11.0	9.1	9.6	9.1	9.0	8.7	8.5	10.5
New York, N. Y.	16.2	15.9	15.5	15.6	15.8	16.0	15.6	15.7	16.2	16.0	15.3	15.4	15.4	15.7	16.8	16.6	16.2	15.9	16.6	17.1	17.2	17.6	17.9	17.4	16.2
Norfolk, Va.	9.5	9.1	9.4	9.7	9.7	9.4	9.5	9.0	9.3	9.3	9.7	10.2	10.5	10.3	10.0	9.8	8.8	8.5	8.7	8.8	9.1	9.4	9.8	9.1	9.4
Northfield, Vt.	9.1	8.9	8.2	7.9	7.8	8.0	8.8	8.8	8.9	9.4	10.5	10.4	10.9	11.2	11.3	10.4	9.1	8.7	8.7	8.9	9.6	9.3	8.2	8.0	9.2
North Platte, Nebr.	7.6	7.2	7.4	7.4	7.7	7.5	7.1	7.1	6.9	7.5	9.1	10.8	12.5	14.5	14.7	14.4	13.7	11.1	9.5	8.6	9.0	8.9	8.9	8.5	9.5
Oklahoma, Okla.	8.5	8.0	8.5	8.8	8.8	9.1	9.1	9.3	9.9	10.2	11.0	11.4	11.5	12.0	12.4	12.0	11.7	10.3	8.4	7.7	7.9	8.5	8.6	8.7	9.7
Omaha, Nebr.	7.8	7.4	7.3	7.5	7.5	7.0	7.2	7.5	7.1	7.4	8.3	8.9	9.4	9.8	10.2	10.1	9.4	7.2	7.6	7.8	7.9	8.5	8.6	7.9	8.1
Oswego, N. Y.	13.4	13.2	12.9	13.5	13.4	13.8	13.0	13.6	13.4	13.8	13.9	13.8	13.5	13.9	13.6	12.9	12.7	10.5	8.0	7.8	8.3	8.5	8.2	7.7	8.7
Palestine, Tex.	8.6	8.7	8.2	7.8	7.4	7.0	6.5	6.9	7.1	8.2	9.3	9.8	10.9	11.3	11.2	11.3	10.5	9.9	12.5	13.2	13.2	12.7	13.1	12.7	13.2
Parkersburg, W. Va.	4.3	4.4	4.2	4.1	4.4	4.4	4.8	5.5	5.8	6.4	7.3	7.5	8.0	8.1	7.8	6.7	5.7	5.9	5.5	5.5	5.0	5.1	4.7	4.6	5.7

TABLE VI.—*Average wind movement, etc.*—Continued.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Pensacola, Fla.	10.3	10.5	10.1	9.5	8.8	8.9	8.8	8.8	9.5	11.0	11.2	12.4	13.1	13.7	13.6	13.6	12.7	11.5	9.5	9.6	9.9	9.5	10.0	10.6	10.7
Philadelphia, Pa.	11.4	11.5	11.4	10.6	10.4	10.6	10.2	10.7	11.4	11.9	12.2	12.1	12.6	12.8	11.7	11.6	10.4	10.3	10.9	11.6	12.3	12.5	11.9	11.1	11.4
Phœnix, Ariz.	4.3	4.1	3.4	3.8	4.3	3.9	4.2	3.7	3.2	3.1	2.9	3.4	4.1	5.2	5.4	5.2	5.0	4.6	3.7	2.9	3.0	4.1	4.4	4.7	4.0
Pierre, S. Dak.	7.7	6.7	6.9	7.0	6.9	6.8	7.2	7.4	6.9	7.5	8.3	9.9	11.5	11.5	12.7	13.9	13.0	11.5	9.6	8.9	7.9	7.6	7.6	7.4	8.8
Pittsburg, Pa.	7.1	6.8	6.6	6.1	6.0	5.9	6.1	6.3	7.2	7.8	8.0	8.6	8.3	8.6	8.5	8.2	6.8	7.3	6.8	6.6	6.5	7.3	7.9	7.3	7.2
Port Angeles, Wash.	6.1	6.3	6.0	6.2	6.6	6.2	6.6	7.2	7.1	6.9	7.1	7.4	7.1	7.4	6.6	6.7	7.7	7.2	6.3	7.3	6.3	6.4	6.4	6.7	6.7
Port Huron, Mich.	11.4	12.0	12.0	12.2	12.3	11.4	11.9	11.7	11.8	13.2	13.0	12.6	13.0	13.7	13.5	13.2	12.2	11.0	10.8	11.3	11.2	11.8	12.3	12.0	12.1
Portland, Me.	8.4	9.0	9.6	9.8	10.0	10.0	9.2	8.9	9.6	9.0	8.7	8.3	8.8	8.2	8.0	7.5	7.3	7.7	8.0	7.8	8.9	8.5	8.6	8.9	8.7
Portland, Oreg.	10.4	10.8	10.5	9.3	10.5	10.9	11.0	10.7	9.6	9.6	9.6	10.6	12.5	11.8	11.4	11.1	11.2	11.3	11.5	10.5	10.5	10.1	10.1	10.2	10.7
Pueblo, Colo.	6.1	6.4	6.5	5.8	6.3	6.9	6.6	6.2	6.4	6.9	8.4	8.7	9.4	11.5	11.4	11.5	11.2	10.1	8.5	7.3	6.4	6.2	6.6	6.0	7.8
Raleigh, N. C.	6.6	7.0	6.8	6.4	6.0	5.7	5.8	6.0	6.9	7.9	8.5	8.5	8.5	8.5	8.1	7.7	6.7	5.8	5.8	6.3	6.9	6.5	7.6	6.9	7.0
Rapid City, S. Dak.	9.3	9.4	8.2	8.9	8.4	8.9	10.1	9.4	9.1	8.6	9.2	9.5	10.7	13.9	14.4	14.2	13.8	11.4	11.0	10.3	9.6	10.5	10.0	10.2	10.4
Red Bluff, Cal.	6.8	6.6	6.4	6.9	5.7	5.3	4.5	4.9	4.7	4.9	4.2	4.3	5.4	6.2	6.4	6.5	6.5	6.6	6.0	5.3	5.4	5.7	5.5	6.3	5.7
Rochester, N. Y.	7.5	7.6	8.1	8.0	7.8	8.1	7.9	7.5	7.5	8.0	8.4	9.1	9.3	8.8	8.5	8.3	7.8	7.8	8.1	8.3	8.3	8.3	8.2	8.0	8.1
Roseburg, Oreg.	2.6	2.9	2.7	2.7	2.9	2.8	2.8	2.6	3.4	3.5	3.5	3.4	3.5	3.7	3.5	4.0	4.0	4.4	4.7	3.9	3.4	3.2	3.1	2.8	3.3
Sacramento, Cal.	7.4	7.7	8.0	9.0	9.2	8.7	8.3	8.1	7.9	8.1	7.5	7.8	7.7	8.4	9.0	9.0	8.5	7.9	7.4	7.2	7.4	7.3	7.5	7.1	8.0
St. Louis, Mo.	12.1	11.7	11.8	10.9	11.2	10.8	11.6	12.2	11.7	11.6	12.6	13.3	13.5	13.6	13.6	14.3	13.9	13.3	12.5	12.3	12.2	12.8	12.8	12.2	12.4
St. Paul, Minn.	6.9	7.3	7.4	7.4	7.3	7.8	7.7	7.5	7.7	7.8	8.2	8.4	8.7	8.9	8.9	9.3	9.2	8.2	7.5	7.2	6.8	6.7	7.1	7.3	7.8
St. Vincent, Minn.	8.7	8.9	8.9	8.5	8.3	8.0	8.5	8.5	8.8	8.5	9.5	10.3	11.2	11.5	11.5	10.7	10.0	8.7	8.5	8.8	9.1	9.0	7.9	7.8	9.2
Salt Lake City, Utah.	3.8	3.9	4.1	4.0	3.9	4.2	4.2	4.2	4.2	4.7	4.7	5.4	6.2	6.9	7.2	7.5	7.4	7.4	6.0	5.3	5.0	4.6	3.9	3.9	5.1
San Antonio, Tex.	8.1	7.6	7.1	8.5	8.4	8.0	7.6	7.5	8.1	8.8	10.9	12.2	12.8	13.7	13.7	13.1	13.8	13.5	11.0	9.3	9.7	10.2	9.5	8.7	10.1
San Diego, Cal.	2.9	3.1	3.6	3.7	3.9	3.4	3.2	3.9	3.5	3.4	3.0	2.4	2.7	3.8	5.5	7.2	8.4	8.5	7.6	5.9	3.7	2.7	3.2	3.0	4.2
Sandusky, Ohio	9.0	9.3	9.4	9.3	9.6	10.1	10.2	10.5	10.7	11.0	11.2	11.4	11.4	10.9	10.5	9.7	9.2	8.5	8.9	8.8	8.9	9.0	9.2	8.8	9.8
San Francisco, Cal.	6.3	6.4	6.2	6.2	6.5	6.3	6.1	6.1	6.4	7.3	7.1	6.9	7.3	8.0	8.3	8.6	9.1	9.2	8.7	8.5	8.2	7.1	6.2	6.5	7.3
San Luis Obispo, Cal.	4.5	4.5	4.3	4.8	4.6	4.5	4.8	5.3	5.1	4.8	5.1	4.8	5.5	6.1	7.0	7.3	7.5	8.0	6.8	7.0	6.1	5.5	5.1	4.8	5.6
Santa Fe, N. Mex.	5.3	5.5	5.6	6.2	6.4	6.0	5.5	6.4	6.5	6.6	7.5	9.0	9.8	11.0	10.7	9.8	9.6	9.3	7.1	5.6	5.6	6.8	7.3	6.5	7.3
Sault Ste Marie, Mich.	7.9	7.8	7.9	7.6	7.7	7.6	7.6	7.8	7.6	7.6	8.2	9.2	9.4	9.2	9.1	9.0	9.0	8.1	8.6	8.7	8.3	8.6	9.0	8.9	8.4
Savannah, Ga.	6.6	6.6	7.0	6.9	7.4	7.5	7.7	6.9	7.6	8.4	8.9	8.8	8.7	8.9	9.2	9.5	8.7	7.4	7.7	8.0	8.2	8.0	7.6	7.3	7.9
Seattle, Wash.	7.3	7.6	7.8	8.1	8.0	8.4	8.3	7.8	8.3	8.4	8.3	7.4	8.6	9.1	8.9	8.9	8.0	7.2	6.8	7.2	7.1	6.7	6.9	7.2	7.8
Shreveport, La.	9.6	10.1	9.7	9.0	9.0	9.0	9.0	9.3	9.1	10.2	11.0	11.1	11.0	11.1	11.5	12.1	11.9	10.7	9.3	9.4	9.8	10.2	9.6	9.7	10.1
Sioux City, Iowa.	10.4	10.4	10.4	10.7	10.0	9.7	9.4	9.4	10.0	10.5	11.6	12.7	13.5	14.4	14.2	14.4	13.8	11.4	9.3	9.0	8.9	9.3	9.8	10.2	11.0
Spokane, Wash.	6.9	7.2	7.3	7.1	7.0	7.1	7.1	7.5	7.4	8.0	8.8	8.5	10.0	9.5	10.0	9.4	9.4	10.0	9.3	9.7	9.7	8.7	8.0	7.5	8.4
Springfield, Ill.	11.0	10.8	10.2	10.2	10.2	10.4	10.2	10.0	9.9	9.8	10.5	10.6	11.9	11.8	12.0	11.7	11.4	10.3	10.2	10.6	11.3	10.6	10.3	10.6	10.7
Springfield, Mo.	11.0	11.5	11.1	11.4	10.7	10.8	9.6	10.0	10.6	11.1	12.3	12.9	13.6	14.1	14.4	14.4	13.7	12.1	11.6	12.4	12.4	12.5	11.9	10.8	12.0
Tampa, Fla.	5.6	5.4	5.0	5.1	5.3	5.6	6.3	6.3	6.6	7.7	8.1	8.8	8.6	8.5	8.4	8.3	7.7	6.5	6.2	5.4	5.5	5.6	5.4	5.4	6.6
Tatoosh Island, Wash.	20.7	21.6	21.4	21.5	20.9	21.3	21.9	22.6	23.3	22.9	22.9	22.8	19.6	21.5	22.2	22.9	21.4	21.6	20.5	20.3	21.0	20.2	20.3	21.4	21.5
Toledo, Ohio.	11.5	10.5	11.0	10.8	10.8	11.3	11.4	11.6	11.5	11.7	12.6	12.5	12.8	12.2	11.9	11.9	10.5	10.0	10.3	10.8	10.6	10.1	10.8	11.1	11.3
Vicksburg, Miss.	10.0	9.6	9.6	9.8	9.9	10.4	10.5	10.7	10.8	10.7	10.7	10.5	10.8	11.1	11.2	10.7	10.4	9.1	8.5	8.3	8.5	9.4	9.6	9.5	10.0
Vineyard Haven, Mass.	11.1	11.2	11.0	10.7	11.2	10.9	11.0	10.5	10.8	10.8	11.8	11.9	12.3	11.4	11.2	10.7	9.5	9.8	10.5	10.4	10.4	11.2	10.9	11.4	11.0
Walla Walla, Wash.	7.2	7.2	7.2	7.2	7.1	6.4	7.0	7.3	7.9	7.8	8.0	8.5	9.0	9.1	9.5	9.9	9.5	8.9	8.4	7.8	8.1	8.3	8.0	7.3	8.0
Washington, D. C.	6.4	6.2	6.1	6.0	6.5	6.1	5.9	5.7	6.3	7.4	8.4	8.4	9.4	9.1	8.9	8.9	7.4	6.8	6.6	6.4	6.3	5.8	6.5	6.3	7.0
Wichita, Kans.	9.4	10.0	10.0	10.5	9.9	9.7	9.9	10.6	10.5	11.5	12.0	12.7	13.2	13.7	14.0	13.8	13.0	11.1	8.8	8.9	8.9	9.3	9.8	10.0	10.9
Williston, N. Dak.	9.7	9.3	10.4	10.4	10.4	10.5	10.2	9.4	9.0	9.5	8.8	8.6	10.0	11.9	12.7	13.3	11.9	10.5	9.9	9.4	10.4	10.4	11.0	10.7	10.9
Wilmington, N. C.	9.0	8.9	7.9	7.7	8.0	7.9	8.0	7.6	8.0	8.4	9.5	10.1	10.8	10.7	10.2	10.0	9.1	7.8	8.3	8.1	8.3	8.9	9.0	8.8	10.4
Winnemucca, Nev.	11.1	9.6	9.7	9.7	10.1	10.1	10.7	12.0	11.2	10.8	10.4	9.4	9.1	10.5	11.1	11.6	11.4	10.4	10.0	9.8	9.5	9.6	10.5	11.5	10.4
Woods Hole, Mass.	19.3	19.5	18.8	18.8	19.4	18.5	17.7	18.5	19.5	18.8	19.2	18.9	19.2	19.1	18.7	18.5	18.3	18.4	18.8	18.6	19.2	18.9	19.9	20.6	19.0
Yuma, Ariz.	4.3	5.1	5.2	5.5	5.4	5.6	5.4	6.1	6.1	6.0	6.8	8.0	10.7	12.0	11.8	11.3	11.3	11.4	10.5	7.4	5.8	5.2	4.7	4.5	7.3

TABLE VII.—*Heights of rivers above low-water mark, December, 1895.*

Stations.	Distance to mouth of river.	Danger-point on gauge.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Mississippi River.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
St. Paul, Minn.	2,057	14.0	.....	.....	.....	.....	.....	.....
La Crosse, Wis.[1]	1,867	10.0	.....	.....	.....	.....	.....	.....
Dubuque, Iowa[1]	1,759	15.0	.....	.....	.....	.....	.....	.....
Davenport, Iowa[2]	1,653	15.0	1.4	7	— 0.5	1,2,4	0.5	1.9
Keokuk, Iowa[2]	1,593	14.0	1.2	5	— 1.4	3	0.3	2.6
Hannibal, Mo.	1,462	17.0	4.0	20	— 1.5	5,6	0.7	5.5
St. Louis, Mo.	1,321	30.0	23.3	22	— 0.1	9	8.2	23.4
Memphis, Tenn.	910	33.0	16.5	28	— 0.8	19,20	4.0	17.3
Helena, Ark.	834	37.0	21.5	31	0.2	20,21	4.7	21.3
Arkansas City, Ark.	702	42.0	28.0	31	— 0.1	1	6.5	28.1
Greenville, Miss.	662	40.0	23.3	31	— 0.2	1	5.2	23.5
Vicksburg, Miss.	541	41.0	21.8	31	— 4.6	1	1.6	26.4
New Orleans, La.	108	13.0	4.8	31	1.8	13	2.9	3.0
Illinois River.								
Beardstown, Ill.	76	12.0	.....	.....	.....	.....	.....	.....
Missouri River.								
Pierre, S. Dak.[1]	1,132	13.0	.....	.....	.....	.....	.....	.....
Sioux City, Iowa[1]	802	18.7	.....	.....	.....	.....	.....	.....
Omaha, Nebr.	667	18.0	.....	.....	.....	.....	.....	.....
Kansas City, Mo.[2]	386	21.0	.....	.....	.....	.....	.....	.....
Ohio River.			6.7	27	3.3	14	4.8	3.4
Parkersburg, W. Va.	786	38.0	19.0	30	3.1	17	7.9	15.9
Catlettsburg, Ky.	652	50.0	22.5	31	3.4	20,21	8.6	19.1
Cincinnati, Ohio	500	45.0	21.8	31	4.4	1	9.4	17.4
Louisville, Ky.	368	34.0	9.0	31	3.0	1	5.0	6.0
Evansville, Ind.	184	30.0	17.0	31	4.0	2,3,6	6.2	13.0
Paducah, Ky.	47	40.0	16.3	31	2.9	19,21,22	5.6	13.4
Cairo, Ill.	1,140*	40.0	36.0	31	3.9	10,16	10.5	22.1
Monongahela River.								
Pittsburg, Pa.	966†	22.0	12.9	28	1.2	15	4.3	11.7
Great Kanawha River.								
Charleston, W. Va.	61	30.0	6.9	24	4.2	5	5.0	2.7

Stations.	Distance to mouth of river.	Danger-point on gauge.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Big Sandy River.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
Louisa, Ky.	.....	.....	6.5	30	2.9	3,4,6,7	3.9	3.6
Wabash River.								
Mount Carmel, Ill.	50	15.0	8.4	31	1.6	19	3.7	6.8
Cumberland River.								
Burnside, Ky.	404	50.0	15.0	28	1.5	,7	3.5	13.5
Nashville, Tenn.	145	40.0	20.4	28	1.7	1	5.0	18.7
Tennessee River.								
Knoxville, Tenn.	640	39.0	2.5	23	—1.5	1	0.5	4.0
Chattanooga, Tenn.	455	33.0	5.2	29	1.3	,10	2.4	3.9
Johnsonville, Tenn.	94	21.0	11.9	29	0.8	1	2.3	11.1
Arkansas River.								
Fort Smith, Ark.	351	22.0	27.6	26	2.1	18	10.9	25.5
Little Rock, Ark.	176	23.0	23.5	29	3.4	8,19	10.3	20.1
Red River.								
Shreveport, La.	449	29.2	9.3	31	—2.3	18,19	0.7	11.6
James River.								
Lynchburg, Va.	251	18.0	3.0	22	—0.1	15-17	0.6	3.1
Congaree River.								
Columbia, S. C.	.....	15.0	2.1	23	0.2	9	0.9	1.9
Savannah River.								
Augusta, Ga.	140	32.6	10.2	31	5.4	8	6.7	4.8
Alabama River.								
Montgomery, Ala.	215	48.0	8.7	31	0.4	1,2,7,8,23	1.0	3.3
Williamette River.								
Portland, Oreg.	.....	15.0	8.9	22	1.9	3	4.8	7.0
Sacramento River.								
Red Bluff, Cal.	.....	20.0	9.2	20	1.0	{3,12-14,}	2.5	8.2
Sacramento, Cal.	.....	28.0	13.6	22	8.8	{27-31}	10.2	4.8

*To mouth of Mississippi River. †To mouth of Ohio River. [1]River frozen. [2]Record for 21 days. [3]Record for 20 days.

TABLE VIII.—*Temperature of the wet-bulb thermometer, December, 1895.*

Stations.	Local time faster or slower than 75th meridian time.	8 A. M.			8 P. M.		
		Max.	Min.	Mean.	Max.	Min.	Mean.
New England.	h. m.	°	°	°	°	°	°
Eastport, Me	32 F.	51	2	26	52	5	28
Portland, Me	19 F.	53	— 1	26	51	8	29
Northfield, Vt	9 F.	44	—13	19	46	— 3	23
Boston, Mass	16 F.	55	7	31	55	11	33
Nantucket, Mass	20 F.	53	23	37	55	24	38
Woods Hole, Mass	17 F.	.....	.....	.....	54	21	36
Block Island, R. I	14 F.	55	12	34	55	12	36
New Haven, Conn	8 F.	52	7	29	53	10	33
New London, Conn	.....	70	46	61	72	44	62
Middle Atlantic States.							
Albany, N. Y	5 F.	47	0	26	56	4	31
New York, N. Y	4 F.	53	13	31	54	15	35
Harrisburg, Pa	7 S.	54	13	30	60	18	35
Philadelphia, Pa	0	52	12	33	59	17	36
Baltimore, Md	6 S.	51	12	32	56	20	36
Washington, D. C	8 S.	53	12	32	60	19	36
Lynchburg, Va	16 S.	56	16	32	56	23	36
Norfolk, Va	5 S.	57	23	38	64	29	43
South Atlantic States.							
Charlotte, N. C	23 S.	57	18	34	59	23	39
Hatteras, N. C	2 S.	65	28	44	64	30	47
Kittyhawk, N. C	3 S.	60	24	41	63	28	44
Raleigh, N. C	14 S.	59	20	35	60	23	40
Wilmington, N. C	12 S.	63	22	40	66	27	45
Charleston, S. C	20 S.	64	28	44	62	34	48
Augusta, Ga	27 S.	58	21	37	58	27	43
Savannah, Ga	24 S.	62	25	42	61	30	46
Jacksonville, Fla	26 S.	63	26	45	63	34	50
Florida Peninsula.							
Jupiter, Fla	20 S.	72	42	58	70	42	59
Key West, Fla	27 S.	72	48	62	74	52	63
Tampa, Fla	30 S.	66	32	51	67	38	53
Eastern Gulf States.							
Atlanta, Ga	37 S.	58	16	37	59	26	42
Pensacola, Fla	49 S.	65	27	43	65	32	48
Mobile, Ala	52 S.	64	28	42	64	32	48
Montgomery, Ala	45 S.	60	20	39	63	29	45
Meridian, Miss	55 S.	62	19	37	61	28	44
Vicksburg, Miss	1 08 S.	61	23	41	64	31	45
New Orleans, La	1 00 S.	63	30	45	66	34	50
Western Gulf States.							
Shreveport, La	1 14 S.	64	26	42	63	30	45
Fort Smith, Ark	1 17 S.	59	16	35	60	22	41
Little Rock, Ark	1 08 S.	60	17	37	60	28	42
Corpus Christi, Tex	1 30 S.	68	26	50	69	37	54
Galveston, Tex	1 19 S.	65	30	50	64	36	52
Palestine, Tex	1 22 S.	64	22	41	65	30	46
San Antonio, Tex	1 34 S.	65	23	42	66	31	47
Ohio Valley and Tenn.							
Chattanooga, Tenn	41 S.	57	15	35	57	22	39
Knoxville, Tenn	36 S.	57	19	33	57	21	38
Memphis, Tenn	1 00 S.	59	22	37	61	27	42
Nashville, Tenn	47 S.	57	13	35	55	18	38
Lexington, Ky	38 S.	53	10	32	56	16	35
Louisville, Ky	43 S.	56	15	33	56	19	36
Indianapolis, Ind	44 S.	55	9	30	53	17	32
Cincinnati, Ohio	38 S.	59	14	32	54	20	35
Columbus, Ohio	32 S.	52	13	30	53	18	34
Pittsburg, Pa	20 S.	56	15	33	55	21	36
Parkersburg, W. Va	26 S.	54	16	32	56	18	35
Lower Lake Region.							
Buffalo, N. Y	15 S.	52	9	30	51	16	32
Oswego, N. Y	6 S.	48	3	27	53	9	30
Rochester, N. Y	11 S.	49	3	28	52	14	30
Erie, Pa	30 S.	54	9	30	53	13	32
Cleveland, Ohio	27 S.	51	10	29	54	16	32
Sandusky, Ohio	30 S.	52	11	30	54	13	32
Toledo, Ohio	34 S.	52	6	28	52	13	30
Detroit, Mich	32 S.	50	7	27	52	11	29
Upper Lake Region.							
Alpena, Mich	34 S.	39	10	24	41	9	26
Grand Haven, Mich	45 S.	43	5	28	51	15	29
Marquette, Mich	49 S.	40	3	22	38	12	25
Port Huron, Mich	30 S.	52	6	26	50	10	28
Sault Ste. Marie, Mich	37 S.	43	— 8	21	40	6	23
Chicago, Ill	50 S.	52	0	26	50	11	29

Stations.	Local time faster or slower than 75th meridian time.	8 A. M.			8 P. M.		
		Max.	Min.	Mean.	Max.	Min.	Mean.
Up. Lake Region—Con.	h. m.	°	°	°	°	°	°
Milwaukee, Wis	51 S.	44	— 1	24	47	10	27
Green Bay, Wis	52 S.	45	— 2	21	36	9	23
Duluth, Minn	08 S.	38	— 7	16	36	3	20
North Dakota.							
Moorhead, Minn	1 27 S.	32	—15	9	35	— 4	16
St. Vincent, Minn	1 29 S.	32	—21	6	34	—14	11
Bismarck, N. Dak	1 42 S.	32	—16	12	34	— 8	16
Williston, N. Dak	1 54 S.	34	— 9	12	36	0	16
Upper Mississippi Valley.							
St. Paul, Minn	1 12 S.	34	— 1	17	36	2	21
La Crosse, Wis	1 05 S.	49	— 9	20	40	5	23
Davenport, Iowa	1 02 S.	51	2	25	52	9	28
Des Moines, Iowa	1 14 S.	36	1	22	50	9	30
Keokuk, Iowa	1 06 S.	53	3	26	53	10	30
Cairo, Ill	56 S.	56	14	34	60	20	38
Springfield, Ill	58 S.	53	4	29	52	10	31
Hannibal, Mo	1 05 S.	53	4	28	54	13	31
St. Louis, Mo	1 01 S.	55	6	32	55	15	35
Missouri Valley.							
Columbia, Mo	1 09 S.	.....	.....	.....	.....	.....	.....
Kansas City, Mo	1 18 S.	59	7	28	56	13	32
Springfield, Mo	1 13 S.	54	5	31	56	12	34
Omaha, Nebr	1 34 S.	37	3	22	50	7	28
Sioux City, Iowa	1 26 S.	39	— 5	19	43	3	25
Pierre, S. Dak	1 41 S.	35	— 5	17	42	6	26
Huron, S. Dak	1 32 S.	32	—10	13	38	— 2	21
Northern Slope.							
Havre, Mont	2 19 S.	41	—24	18	44	—12	21
Miles City, Mont	2 03 S.	40	— 5	17	40	2	23
Helena, Mont	2 38 S.	42	— 4	19	38	— 2	23
Rapid City, S. Dak	1 53 S.	40	— 3	23	40	1	25
Cheyenne, Wyo	1 59 S.	38	— 5	20	36	2	22
Lander, Wyo	2 15 S.	24	— 9	9	34	2	18
North Platte, Nebr	1 43 S.	32	3	19	44	9	27
Middle Slope.							
Denver, Colo	2 00 S.	36	4	22	41	14	28
Pueblo, Colo	1 58 S.	36	4	21	43	15	28
Concordia, Kans	1 31 S.	34	5	23	48	10	29
Dodge City, Kans	1 40 S.	34	4	23	42	9	29
Wichita, Kans	1 29 S.	45	8	26	56	15	33
Oklahoma, Okla	1 30 S.	60	10	30	60	17	36
Southern Slope.							
Abilene, Tex	1 39 S.	57	19	34	59	24	40
Amarillo, Tex	1 47 S.	37	9	25	45	12	32
Southern Plateau.							
El Paso, Tex	2 06 S.	42	13	27	46	23	36
Santa Fe, N. Mex	2 04 S.	30	1	17	32	3	23
Phœnix, Ariz	2 28 S.	49	22	36	56	32	45
Yuma, Ariz	2 38 S.	48	25	37	52	34	45
Independence, Cal	2 53 S.	32	17	26	40	24	33
Middle Plateau.							
Carson City, Nev	2 59 S.	39	7	24	43	19	33
Winnemucca, Nev	2 51 S.	38	—10	19	39	14	28
Salt Lake City, Utah	2 27 S.	34	6	22	36	13	26
Northern Plateau.							
Baker City, Oreg	2 51 S.	33	— 3	22	36	10	26
Idaho Falls, Idaho	2 28 S.	37	— 3	15	32	7	20
Spokane, Wash	2 49 S.	43	14	28	46	20	31
Walla Walla, Wash	2 53 S.	48	20	34	51	23	37
N. Pac. Coast Region.							
Fort Canby, Wash	3 16 S.	51	30	42	52	34	42
Port Angeles, Wash	3 14 S.	47	22	37	52	31	39
Seattle, Wash	3 09 S.	50	28	38	53	32	40
Tatoosh Island, Wash	3 19 S.	55	31	42	52	33	42
Portland, Oreg	3 11 S.	54	31	39	53	31	40
Roseburg, Oreg	3 13 S.	52	28	38	55	32	42
Mid. Pac. Coast Region.							
Eureka, Cal	3 17 S.	52	31	42	56	40	47
Red Bluff, Cal	3 09 S.	51	26	37	52	35	43
Sacramento, Cal	3 06 S.	51	27	38	54	38	44
San Francisco, Cal	3 10 S.	54	37	42	56	42	48
S. Pac. Coast Region.							
Fresno, Cal	2 59 S.	46	29	38	55	39	44
Los Angeles, Cal	2 53 S.	50	34	41	58	44	51
San Diego, Cal	2 49 S.	52	32	42	57	44	51
San Luis Obispo, Cal	3 08 S.	52	28	40	55	39	47

TABLE IX.—*Resultant winds from observations at 8 a. m. and 8 p. m., daily, during December, 1895.*

Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.
New England.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
Eastport, Me	23	16	13	27	n. 63 w.	16
Portland, Me	26	16	5	26	n. 65 w.	23
Northfield, Vt	22	30	3	17	s. 60 w.	16
Boston, Mass	25	16	4	29	n. 70 w.	27
Nantucket, Mass	34	12	30	21	n. 5 w.	12
Woods Hole, Mass.*	11	11	5	12	w.	7
Block Island, R. I	23	12	17	26	n. 39 w.	14
New Haven, Conn	30	16	5	18	n. 43 w.	19
Middle Atlantic States.						
Albany, N. Y	22	25	6	15	s. 72 w.	10
New York, N. Y	22	15	16	24	n. 49 w.	11
Harrisburg, Pa	16	6	27	18	n. 42 e.	14
Philadelphia, Pa	22	18	12	20	n. 63 w.	9
Baltimore, Md	26	19	13	13	n.	7
Washington, D. C	23	18	12	17	n. 45 w.	7
Lynchburg, Va	18	23	18	19	s. 11 w.	5
Norfolk, Va	27	20	15	12	n. 23 e.	8
South Atlantic States.						
Charlotte, N. C	18	23	28	8	s. 76 e.	21
Hatteras, N. C	31	14	13	17	n. 13 w.	18
Kittyhawk, N. C	27	17	12	20	n. 39 w.	13
Raleigh, N. C	28	22	9	15	n. 45 w.	8
Wilmington, N. C	21	16	18	20	n. 22 w.	5
Charleston, S. C	22	16	15	22	n. 49 w.	9
Augusta, Ga	23	14	15	22	n. 38 w.	11
Savannah, Ga	15	21	14	26	s. 63 w.	13
Jacksonville, Fla	28	10	19	21	n. 6 w.	18
Florida Peninsula.						
Jupiter, Fla	19	8	21	25	n. 20 w.	12
Key West, Fla	37	4	29	7	n. 84 e.	40
Tampa, Fla	40	6	17	12	n. 8 e.	34
Eastern Gulf States.						
Atlanta, Ga	16	17	16	29	s. 86 w.	13
Pensacola, Fla	27	15	21	18	n. 14 e.	12
Mobile, Ala	26	20	14	15	n. 9 w.	6
Montgomery, Ala	17	21	25	15	s. 68 w.	11
Meridian, Miss	22	23	17	15	s. 63 e.	2
Vicksburg, Miss	15	26	23	15	s. 36 e.	14
New Orleans, La	17	19	27	15	s. 81 e.	12
Western Gulf States.						
Shreveport, La	11	22	11	20	s. 39 w.	14
Fort Smith, Ark	17	9	8	16	n. 45 w.	11
Little Rock, Ark	14	24	11	22	s. 48 w.	15
Corpus Christi, Tex	21	23	26	12	s. 82 e.	14
Galveston, Tex	30	24	14	17	s. 37 w.	5
Palestine, Tex	14	30	5	26	s. 53 w.	26
San Antonio, Tex	27	21	14	9	n. 40 e.	8
Ohio Valley and Tennessee.						
Chattanooga, Tenn	15	23	10	22	s. 56 w.	14
Knoxville, Tenn	21	20	14	25	n. 85 w.	11
Memphis, Tenn	11	31	17	16	s. 3 e.	20
Nashville, Tenn	12	31	25	16	s. 25 e.	21
Lexington, Ky	11	37	9	20	s. 23 w.	28
Louisville, Ky	13	35	18	11	s. 18 e.	23
Indianapolis, Ind	15	31	15	17	s. 7 w.	16
Cincinnati, Ohio	11	29	21	15	s. 18 e.	19
Columbus, Ohio	11	33	28	17	s. 26 e.	25
Pittsburg, Pa	12	29	21	20	s. 3 e.	17
Parkersburg, W. Va	10	27	22	12	s. 30 e.	20
Lower Lake Region.						
Buffalo, N. Y	11	24	15	26	s. 40 w.	17
Oswego, N. Y	11	37	17	13	s. 9 e.	26
Rochester, N. Y	4	31	12	29	s. 33 w.	32
Erie, Pa	10	35	13	18	s. 11 w.	26
Cleveland, Ohio	8	35	23	15	s. 17 e.	28
Sandusky, Ohio	14	26	12	29	s. 55 w.	21
Toledo, Ohio	14	28	9	28	s. 54 w.	24
Detroit, Mich	13	29	9	32	s. 55 w.	28
Upper Lake Region.						
Alpena, Mich	9	25	12	30	s. 48 w.	24
Grand Haven, Mich	17	20	21	19	s. 34 e.	4
Marquette, Mich	18	23	8	29	s. 77 w.	22
Port Huron, Mich	6	38	12	18	s. 11 w.	33
Sault Ste. Marie, Mich	12	26	28	15	s. 43 e.	19
Chicago, Ill	18	26	5	25	s. 68 w.	22

Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.
Upper Lake Region—Cont'd.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
Milwaukee, Wis	18	21	9	28	s. 81 w.	19
Green Bay, Wis	14	36	5	22	s. 38 w.	28
Duluth, Minn	16	21	5	35	s. 81 w.	30
North Dakota.						
Moorhead, Minn	19	27	5	21	s. 63 w.	18
St. Vincent, Minn	15	33	7	17	s. 29 w.	21
Bismarck, N. Dak	28	10	7	34	n. 56 w.	32
Williston, N. Dak	20	16	6	31	n. 81 w.	25
Upper Mississippi Valley.						
St. Paul, Minn	13	22	14	27	s. 55 w.	16
La Crosse, Wis	14	28	5	23	s. 51 w.	23
Davenport, Iowa	16	18	15	27	s. 81 w.	12
Des Moines, Iowa	28	16	5	27	n. 61 w.	25
Keokuk, Iowa	25	20	9	26	n. 74 w.	18
Cairo, Ill	17	34	9	14	s. 16 w.	18
Springfield, Ill	16	29	8	21	s. 45 w.	18
Hannibal Mo	20	23	6	22	s. 79 w.	16
St. Louis, Mo	19	26	12	16	s. 80 w.	8
Missouri Valley.						
Columbia, Mo.*	12	8	3	11	n. 37 w.	5
Kansas City, Mo	28	18	12	18	n. 31 w.	12
Springfield, Mo	19	28	10	16	s. 34 w.	11
Omaha, Nebr	23	17	5	27	n. 75 w.	23
Sioux City, Iowa	24	25	5	22	s. 87 w.	17
Pierre, S. Dak	20	15	16	24	n. 58 w.	9
Huron, S. Dak	14	23	15	25	s. 48 w.	14
Northern Slope.						
Havre, Mont	18	19	6	30	s. 88 w.	33
Miles City, Mont	9	29	6	27	s. 46 w.	29
Helena, Mont	8	26	1	45	s. 68 w.	48
Rapid City, S. Dak	13	19	5	38	s. 80 w.	34
Cheyenne, Wyo	28	5	2	43	n. 61 w.	47
Lander, Wyo	14	24	8	32	s. 67 w.	26
North Platte, Nebr	12	17	2	39	s. 82 w.	37
Middle Slope.						
Denver, Colo	19	29	13	16	s. 17 w.	10
Pueblo, Colo	27	10	10	28	n. 47 w.	25
Concordia, Kans	26	18	4	25	n. 69 w.	22
Dodge City, Kans	37	11	12	18	n. 13 w.	27
Wichita, Kans	30	21	7	15	n. 42 w.	12
Oklahoma, Okla	30	20	2	20	n. 61 w.	21
Southern Slope.						
Abilene, Tex	24	19	6	24	n. 74 w.	19
Amarillo, Tex	29	18	4	21	n. 57 w.	20
Southern Plateau.						
El Paso, Tex	28	2	9	38	n. 48 w.	39
Santa Fe, N. Mex	34	14	27	5	n. 48 e.	30
Phœnix, Ariz	4	40	15	16	s. 2 w.	36
Yuma, Ariz	44	4	24	9	n. 21 e.	43
Independence, Cal	21	17	6	33	n. 82 w.	27
Middle Plateau.						
Carson City, Nev	28	15	9	17	n. 32 w.	15
Winnemucca, Nev	15	17	27	18	s. 77 e.	9
Salt Lake City, Utah	10	24	25	14	s. 38 e.	18
Northern Plateau.						
Baker City, Oreg	10	39	23	10	s. 24 e.	32
Idaho Falls, Idaho	22	28	7	16	s. 56 w.	11
Spokane, Wash	8	34	16	17	s. 2 w.	26
Walla Walla, Wash	7	39	8	14	s. 11 w.	33
North Pacific Coast Region.						
Fort Canby, Wash	4	26	24	17	s. 18 e.	23
Port Angeles, Wash	2	43	10	20	s. 14 w.	42
Seattle, Wash	10	39	19	7	s. 22 e.	31
Tatoosh Island, Wash	2	19	27	22	s. 16 e.	18
Portland, Oreg	7	36	18	12	s. 12 e.	30
Roseburg, Oreg	6	28	18	20	s. 5 w.	22
Middle Pacific Coast Region.						
Eureka, Cal	15	22	27	14	s. 62 e.	14
Red Bluff, Cal	30	17	13	18	n. 21 w.	14
Sacramento, Cal	21	25	20	12	s. 63 e.	9
San Francisco, Cal	32	8	13	21	n. 18 w.	25
South Pacific Coast Region.						
Fresno, Cal	14	5	29	23	n. 34 e.	11
Los Angeles, Cal	33	4	17	22	n. 10 w.	29
San Diego, Cal	34	2	20	21	n. 2 w.	32
San Luis Obispo, Cal	43	9	5	16	n. 18 w.	36

* From observations at 8 p. m. only.

TABLE X.—*Thunderstorms and auroras, December, 1895.*

States.	No. of stations.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total. No.	Total. Days.	
Alabama	50	T.																	1	4	2											11	4	T.
		A.																														0	0	A.
Arizona	42	T.																														0	0	T.
		A.																														0	0	A.
Arkansas	47	T.	4																1	4	2											11	4	T.
		A.																														0	0	A.
California	202	T.														1	3					3										7	3	T.
		A.															1															1	1	A.
Colorado	82	T.																														0	0	T.
		A.	1																									1				2	1	A.
Connecticut	22	T.																						1								1	1	T.
		A.																														0	0	A.
Delaware	6	T.																														0	0	T.
		A.														1																1	1	A.
Dist. of Columbia	4	T.																														0	0	T.
		A.																														0	0	A.
Florida	38	T.									1			1																		2	2	T.
		A.																														0	0	A.
Georgia	38	T.									3																					3	2	T.
		A.																														0	0	A.
Idaho	34	T.																														0	0	T.
		A.																														0	0	A.
Illinois	97	T.	1															3	14	1	1					3						23	6	T.
		A.							2														1					1				4	3	A.
Indiana	46	T.																														0	0	T.
		A.																														0	0	A.
Indian Territory	8	T.																	1	2												3	2	T.
		A.																														0	0	A.
Iowa	96	T.															1		21													22	2	T.
		A.							1			1																				2	2	A.
Kansas	82	T.															1	2	11	6	1											21	5	T.
		A.																														0	0	A.
Kentucky	30	T.																							1							1	1	T.
		A.																														0	0	A.
Louisiana	47	T.	2	1						3											4						1			4	1	16	7	T.
		A.																														0	0	A.
Maine	16	T.																														0	0	T.
		A.		1						2	1				1																	5	4	A.
Maryland	42	T.																					4					1				5	2	T.
		A.																			2	2										4	2	A.
Massachusetts	81	T.		1																						1			1		1	1	1	T.
		A.								2																						5	4	A.
Michigan	80	T.																3	1												1	4	2	T.
		A.																														1	1	A.
Minnesota	70	T.																1	1										1			3	3	T.
		A.							4	1	1		1							1												8	5	A.
Mississippi	47	T.	1																		1											2	2	T.
		A.																														0	0	A.
Missouri	96	T.	1																16	14	7					1						39	5	T.
		A.																														0	0	A.
Montana	30	T.																										1				1	1	T.
		A.									2	1	1				1									2						7	5	A.
Nebraska	136	T.															1	2	4	1					1							9	5	T.
		A.							1	1															1						1	4	4	A.
Nevada	54	T.																														0	0	T.
		A.																														0	0	A.
New Hampshire	24	T.																														0	0	T.
		A.								5													1	1		1						7	3	A.
New Jersey	52	T.																														1	1	T.
		A.									1	2																				3	2	A.
New Mexico	34	T.																														0	0	T.
		A.																														0	0	A.
New York	90	T.																					4									4	1	T.
		A.																														0	0	A.
North Carolina	52	T.												1																		1	1	T.
		A.																														0	0	A.
North Dakota	36	T.																								1						1	1	T.
		A.							3	3	1	4	1				1			1	1			1		1		1				18	11	A.
Ohio	134	T.																				2										2	1	T.
		A.																														0	0	A.
Oklahoma	20	T.																	3	3												6	2	T.
		A.																														0	0	A.
Oregon	63	T.												1	3	1				1		1			2							9	6	T.
		A.																														0	0	A.
Pennsylvania	100	T.																					8			1						8	6	T.
		A.																														1	1	A.
Rhode Island	8	T.																														0	0	T.
		A.																														0	0	A.
South Carolina	38	T.																										1				1	1	T.
		A.																														0	0	A.
South Dakota	46	T.																														0	0	T.
		A.									1				1																	2	2	A.
Tennessee	47	T.	2																													2	1	T.
		A.		1																												1	1	A.
Texas	85	T.	1						1	1							1		2	1	6			1	2	7					3	26	11	T.
		A.																														0	0	A.
Utah	34	T.																														0	0	T.
		A.																														0	0	A.
Vermont	16	T.																														0	0	T.
		A.								1																1			1		1	4	4	A.
Virginia	37	T.																					1					5	1			7	3	T.
		A.																							1							1	1	A.
Washington	47	T.											1	1	2										1							5	4	T.
		A.																														0	0	A.
West Virginia	38	T.																					2					1				3	2	T.
		A.																														0	0	A.
Wisconsin	58	T.																1	5	1												7	3	T.
		A.						2		2	1				1																	6	4	A.
Wyoming	13	T.																														0	0	T.
		A.																														0	0	A.
Sums	2,705	T.	12	2	0	0	0	0	1	4	4	0	1	4	5	2	7	12	80	34	22	6	20	2	6	11	1	8	3	0	7	1	0	255	....	T.
		A.	1	2	0	0	0	2	11	17	8	0	3	0	3	1	3	1	0	2	3	2	0	3	3	8	0	1	3	1	0	89	....	A.

TABLE XI.—*Hourly sunshine as deduced from sunshine recorders, December, 1895.*

Stations.	Instrument.	Percentages for each hour of local mean time ending with the respective hour.																		Monthly summary.			
		A. M.								P. M.										Instrumental record.			
		5	6	7	8	9	10	11	Noon	1	2	3	4	5	6	7	8	Actual.	Possible.	Per cent of possible.	Personal estimate.
																		Hours.	*Hours.*		
Atlanta, Ga	T.	.....	.....	32	32	42	50	60	66	61	60	63	49	45	40	.....	.....	162.9	308.5	53	55
Baltimore, Md	T.	.....	.....	.....	29	29	39	44	44	45	38	35	25	23	.....	.....	.....	104.3	293.0	36	40
Bismarck, N. Dak	P.	.....	.....	.....	31	35	46	61	50	44	40	29	1	0	.....	.....	.....	98.0	266.6	37	48
Boston, Mass	T.	.....	.....	.....	33	37	45	46	45	48	50	43	44	34	.....	.....	.....	123.2	283.8	43	37
Buffalo, N. Y	T.	.....	.....	.....	3	7	15	25	32	42	33	21	8	0	.....	.....	.....	57.3	281.6	20	17
Chicago, Ill	T.	.....	.....	.....	14	15	24	31	35	38	33	31	22	31	.....	.....	.....	79.4	285.4	28	26
Cincinnati, Ohio	T.	.....	.....	.....	32	38	38	38	38	35	27	29	24	23	.....	.....	.....	95.5	288.7	33	33
Cleveland, Ohio	P.	.....	.....	.....	19	23	31	36	39	43	36	33	22	3	.....	.....	.....	86.2	286.4	30	30
Columbus, Ohio	T.	.....	.....	.....	12	20	33	42	42	45	43	37	19	10	.....	.....	.....	91.9	291.7	32	25
Denver, Colo	P.	.....	.....	.....	74	79	85	84	86	84	79	72	77	70	.....	.....	.....	232.2	292.4	79	60
Des Moines, Iowa	T.	.....	.....	.....	38	39	43	53	55	55	51	47	45	49	.....	.....	.....	136.5	286.5	48	37
Detroit, Mich	T.	.....	.....	.....	21	27	38	41	48	53	50	37	30	20	.....	.....	.....	105.1	283.6	37	32
Dodge City, Kans	P.	.....	.....	64	49	56	68	68	70	72	76	75	68	56	.....	.....	.....	197.0	297.9	66	62
Eastport, Me	P.	.....	.....	.....	28	31	35	49	50	56	67	56	54	49	.....	.....	.....	132.9	274.3	48	37
Eureka, Cal	P.	.....	.....	.....	26	36	38	45	45	42	39	41	38	34	.....	.....	.....	111.3	289.1	38	40
Galveston, Tex	T.	.....	.....	47	43	54	55	60	56	62	66	61	59	49	40	.....	.....	179.5	319.8	56	55
Helena, Mont	P.	.....	.....	.....	27	29	29	33	39	44	40	36	21	20	.....	.....	.....	89.7	267.7	34	32
Kansas City, Mo	P.	.....	.....	.....	39	40	44	49	47	52	51	48	36	35	.....	.....	.....	131.4	293.8	45	41
Little Rock, Ark	T.	.....	.....	42	35	39	46	53	56	57	54	50	52	49	.....	.....	.....	150.6	305.8	49	41
Louisville, Ky	T.	.....	.....	.....	20	23	27	32	27	32	25	25	24	26	.....	.....	.....	77.2	296.0	26	24
New Orleans, La	T.	.....	.....	38	34	56	65	70	70	84	71	66	58	44	43	.....	.....	195.1	317.6	61	60
New York, N. Y	T.	.....	.....	.....	20	32	38	45	52	54	49	36	29	20	.....	.....	.....	112.3	289.1	39	38
Philadelphia, Pa	T.	.....	.....	.....	37	45	58	65	65	68	67	55	55	35	.....	.....	.....	163.4	291.4	56	41
Phœnix, Ariz	P.	.....	.....	86	79	85	91	90	91	90	90	93	93	83	100	.....	.....	274.6	310.3	88	77
Portland, Me	T.	.....	.....	.....	14	44	62	75	79	84	77	60	46	17	.....	.....	.....	167.9	279.4	60	46
Portland, Oreg	T.	.....	.....	.....	8	11	12	16	24	19	15	12	4	3	.....	.....	.....	86.2	272.0	13	20
Do	P.	.....	.....	.....	8	11	11	14	20	19	15	16	5	3	.....	.....	.....	35.9	272.0	13	20
Rochester, N. Y	T.	.....	.....	.....	10	24	45	45	56	67	60	45	28	28	.....	.....	.....	120.7	281.0	43	37
St. Louis, Mo	T.	.....	.....	.....	27	27	45	58	64	57	56	54	49	40	.....	.....	.....	142.8	295.4	48	36
Salt Lake City, Utah	P.	.....	.....	.....	3	13	28	35	36	43	43	39	26	23	.....	.....	.....	86.9	289.1	30	19
San Diego, Cal	P.	.....	.....	64	78	87	91	95	98	97	97	99	83	64	50	.....	.....	272.8	310.7	88	74
San Francisco, Cal	T.	.....	.....	.....	6	36	55	73	84	78	71	74	61	22	.....	.....	.....	171.5	297.3	58	53
Santa Fe, N. Mex	P.	.....	.....	86	79	82	82	85	87	89	83	84	78	67	.....	.....	.....	248.7	303.0	82	70
Savannah, Ga	P.	.....	.....	42	46	67	75	75	64	66	67	65	58	55	50	.....	.....	198.8	313.6	63	57
Vicksburg, Miss	T.	.....	.....	58	41	46	56	64	65	67	66	68	51	47	67	.....	.....	178.9	313.0	57	54
Washington, D. C	P.	.....	.....	.....	29	44	47	50	51	45	50	52	37	29	.....	.....	.....	120.9	294.1	44	46
Wilmington, N. C	T.	.....	.....	31	30	61	70	72	68	72	68	62	60	38	0	.....	.....	185.5	308.2	60	55

TABLE XII.—*Hourly precipitation, December, 1895.*

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Total.
Atlanta, Ga †	0.06	0.23	0.06	0.05	0.23	0.44	0.18	0.13	0.08	0.07	0.13	0.20	0.12	0.13	0.08	0.14	0.18	0.07	T.	T.	0.01	0.04	0.03	0.01	2.67
Baltimore, Md	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bismarck, N. Dak *	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Boston, Mass	0.03	0.20	0.45	0.18	0.47	0.29	0.06	T.	T.	0.01	0.04	0.10	0.02	0.03	0.03	0.02	0.03	0.08	0.03	0.07	0.04	0.05	0.10	0.09	2.43
Buffalo, N. Y	0.11	0.16	0.16	0.11	0.14	0.17	0.09	0.07	0.08	0.08	0.15	0.09	0.26	0.35	0.33	0.23	0.40	0.84	0.42	0.33	0.23	0.16	0.17	0.13	3.26
Chicago, Ill	0.14	0.27	0.29	0.13	0.11	0.14	0.09	0.07	0.11	0.17	0.09	0.07	0.07	0.04	0.07	0.03	0.04	0.01	0.01	0.03	0.07	0.03	0.04	0.04	2.16
Cincinnati, Ohio †	0.13	0.07	0.10	0.09	0.07	0.13	0.15	0.15	0.13	0.20	0.30	0.06	0.05	0.13	0.20	0.27	0.21	0.11	0.07	0.14	0.16	0.03	0.10	0.14	3.19
Cleveland, Ohio †	0.15	0.14	0.19	0.18	0.20	0.16	0.13	0.20	0.31	0.28	0.13	0.17	0.07	0.12	0.14	0.10	0.10	0.17	0.23	0.22	0.19	0.19	0.19	0.16	4.12
Denver, Colo	0.00	0.00	0.00	0.00	0.00	0.00	T.	T.	T.	T.	0.01	T.	T.	T.	T.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Detroit, Mich †	0.23	0.25	0.24	0.25	0.24	0.28	0.27	0.36	0.23	0.20	0.16	0.21	0.22	0.26	0.17	0.15	0.15	0.12	0.13	0.14	0.10	0.07	0.15	0.15	4.73
Dodge City, Kans. *	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Duluth, Minn *	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eastport, Me	0.09	0.06	0.11	0.12	T.	0.02	0.06	0.15	0.20	0.08	0.05	0.05	0.12	0.20	0.26	0.03	0.03	0.02	0.04	0.02	0.03	0.05	0.10	0.05	2.75
Galveston, Tex	0.02	T.	T.	0.01	0.02	0.14	0.16	0.33	0.29	0.30	0.35	0.28	0.88	0.36	0.14	0.16	0.07	0.04	0.05	0.04	0.03	0.07	0.10	0.19	4.04
Indianapolis, Ind.*	0.12	0.14	0.14	0.15	0.13	0.14	0.15	0.09	0.03	0.13	0.15	0.21	0.21	0.22	0.10	0.10	0.24	0.29	0.20	0.19	0.07	0.23	0.08	0.11	4.68
Jacksonville, Fla	0.12	0.02	0.04	0.01	0.01	0.04	0.08	0.00	T.	0.01	0.00	0.01	T.	0.38	0.18	0.07	0.02	0.14	0.03	T.	0.00	0.00	0.00	0.02	1.18
Jupiter, Fla	0.02	0.49	0.60	0.26	0.22	0.26	0.13	0.07	0.01	0.05	0.01	0.04	0.01	0.02	0.04	0.01	0.02	0.49	0.56	1.40	1.17	0.16	0.07	0.02	6.20
Kansas City, Mo *	0.07	0.11	0.19	0.10	0.07	0.06	0.08	0.12	0.23	0.26	0.17	0.09	0.17	0.26	0.31	0.43	0.41	0.33	0.16	0.24	0.11	0.02	T.	0.01	5.13
Key West, Fla	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T.	T.	0.03	0.03	0.05	0.02	0.40	0.01	T.	0.02	0.03	0.15	0.02	0.01	0.00	0.00	0.79
Little Rock, Ark	0.02	0.04	0.05	0.24	0.27	0.04	0.05	0.06	0.08	0.13	0.03	0.05	0.12	0.50	0.55	0.02	0.04	0.03	0.05	0.04	0.05	0.05	0.02	0.02	2.55
Louisville, Ky †	0.20	0.17	0.25	0.24	0.18	0.20	0.27	0.25	0.27	0.20	0.16	0.31	0.33	0.33	0.41	0.20	0.21	0.13	0.06	0.17	0.06	0.09	0.11	0.33	5.13
Memphis, Tenn	0.09	0.13	0.06	0.11	0.04	0.06	0.21	0.16	0.08	0.10	0.02	0.10	0.22	0.53	0.05	0.03	0.11	0.16	0.22	0.25	0.28	0.05	0.03	0.03	3.09
Milwaukee, Wis *	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nantucket, Mass †	0.18	0.09	0.24	0.11	0.05	0.02	0.02	T.	T.	0.06	0.09	0.14	0.03	0.17	0.18	0.15	0.40	0.08	0.13	0.11	0.22	0.07	0.09	0.10	2.73
Nashville, Tenn †	0.27	0.22	0.17	0.12	0.23	0.41	0.19	0.17	0.29	0.16	0.12	0.11	0.04	0.06	0.18	0.02	0.02	0.08	0.15	0.10	0.12	0.23	0.26	0.35	4.07
New Orleans, La	0.35	0.17	0.12	0.00	0.00	0.00	0.00	T.	T.	T.	0.00	T.	0.08	0.02	0.12	0.07	0.56	0.33	0.50	0.67	0.43	0.08	0.75	0.31	4.52
New York, N. Y	0.06	0.39	0.73	0.06	T.	0.01	T.	0.03	0.10	0.02	T.	0.01	0.07	0.05	0.01	0.02	0.03	0.01	0.01	T.	0.01	0.04	0.07	0.14	1.87
Norfolk, Va	0.09	0.04	0.05	0.03	0.12	0.11	0.12	0.10	0.19	0.20	0.21	0.22	0.17	0.12	0.39	0.07	0.04	0.03	0.04	0.11	0.05	0.12	0.23	0.53	3.39
Omaha, Nebr *	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Philadelphia, Pa †	0.03	0.04	0.03	0.01	0.04	0.02	0.20	0.14	T.	0.01	0.01	0.04	0.15	0.03	0.04	0.02	0.03	0.02	0.07	0.09	0.17	0.08	0.31	0.09	1.67
Pittsburg, Pa †	0.09	0.09	0.08	0.07	0.11	0.09	0.10	0.06	0.16	0.19	0.28	0.26	0.27	0.27	0.23	0.12	0.12	0.11	0.12	0.12	0.07	0.07	0.06	0.06	3.20
Portland, Me †	0.24	0.07	0.10	0.30	0.12	0.04	0.24	0.47	0.11	0.05	0.04	0.08	0.04	0.03	0.05	0.08	0.04	0.03	0.03	0.03	0.25	0.21	0.30	0.35	3.30
Portland, Oreg	0.38	0.36	0.32	0.21	0.29	0.35	0.32	0.43	0.27	0.31	0.48	0.43	0.28	0.51	0.55	0.34	0.27	0.44	0.38	0.34	0.52	0.34	0.47	0.27	8.76
Rochester, N. Y †	0.16	0.13	0.09	0.05	0.04	0.05	0.05	0.09	0.11	0.08	0.14	0.08	0.06	0.10	0.11	0.19	0.26	0.24	0.15	0.47	0.42	0.32	0.30	0.13	3.82
St. Louis, Mo	0.08	0.07	0.26	0.24	0.31	0.30	0.18	0.17	0.20	0.28	0.22	0.15	0.13	0.01	0.08	0.18	0.39	0.14	0.15	0.27	0.10	0.29	0.15	0.15	4.51
St. Paul, Minn	0.02	0.02	0.00	0.00	0.00	0.00	T.	T.	0.04	0.04	0.04	0.06	0.02	0.02	T.	T.	T.	T.	0.04	T.	T.	0.02	0.02	0.03	0.38
Salt Lake City, Utah *	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Diego, Cal	0.12	0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27
San Francisco, Cal	0.01	0.08	0.07	0.19	0.14	0.10	0.16	0.15	0.07	0.06	0.07	0.09	0.08	0.11	0.04	0.03	T.	T.	T.	0.02	T.	T.	T.	T.	1.42
Savannah, Ga	0.05	0.06	0.08	0.11	0.07	0.02	0.02	0.09	0.01	T.	0.01	0.01	0.02	0.09	0.04	0.01	0.12	0.23	0.14	0.05	0.07	0.08	0.23	0.08	1.71
Seattle, Wash	0.38	0.33	0.45	0.49	0.54	0.53	0.38	0.33	0.30	0.38	0.25	0.32	0.40	0.22	0.22	0.20	0.25	0.22	0.33	0.49	0.17	0.29	0.15	0.26	7.66
Vicksburg, Miss	0.04	0.01	T.	T.	0.11	0.03	T.	T.	0.01	0.02	0.04	0.06	0.05	0.06	0.12	0.24	0.27	0.22	0.51	0.47	0.21	0.18	0.25	0.10	3.70
Washington, D. C	0.07	0.07	0.04	T.	0.02	0.03	T.	0.02	0.04	0.01	0.11	0.14	0.12	0.02	0.01	0.03	0.24	0.22	0.41	0.08	0.33	0.08	0.08	0.18	2.35
Wilmington, N. C	0.01	0.01	0.02	0.07	0.05	0.09	0.06	0.10	0.03	0.06	0.08	0.07	0.02	0.02	0.08	0.33	0.01	T.	0.09	0.07	0.04	0.04	0.04	0.01	1.40

* Record incomplete, on account of snow. † Partly estimated

TABLE XIII.—*Excessive precipitation, by stations, for December, 1895.*

Stations.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Alabama.	*Inches.*	*Inches.*		*Ins.*	*h. m.*	
Decatur		3.55	25-26			
Newburg		3.61	25-26			
Pushmataha		2.95	29			
Union		2.75	25			
Arkansas.						
Fayetteville		3.95	19			
Fort Smith		3.48	18-19			
Keesees Ferry		6.20	19-20			
Mount Nebo		4.36	18-19			
Lonoke		3.90	19			
Silver Springs		4.00	19			
Winslow	10.04	5.00	17-18			
Witts Springs		5.65	19			
California.						
Bowmans Dam	11.32	3.37	5-6			
Edmanton		3.14	20			
Fordyce Dam	10.19	3.05	20-21			
La Porte		2.78	5-6			
Do		4.14	19-20			
Malakoff Mine		3.00	19-20			
Upper Mattole		3.79	19-20			
Washington		2.75	18			
Florida.						
Hypoluxo		3.23	8-9			
Jupiter		4.17	1-2	2.70	1 24	1
Illinois.						
Alexander		5.11	18-19			
Altamont		2.58	18-19			
Atlanta		2.52	18			
Aurora *a*		2.83	20			
Beardstown		3.30	19			
Bloomington		4.11	17-18			
Carlinville		2.75	19			
Chicago		3.95	18-20			
Decatur		2.85	18			
Glenwood		2.50	20			
Grafton		5.38	18-20			
Havana		2.82	19			
Joliet		2.99	19			
Lexington		2.55	17-18			
Loami		6.25	18-19			
Mount Pulaski		3.00	19			
Oswego		2.98	19-20			
Indiana.						
South Bend		2.50	19			
Indian Territory.						
Tulsa		4.90	17-18			
Vinita	12.70	8.96	17-19			
Iowa.						
Indianola		2.65	17			
Kansas.						
Columbus	10.50	4.75	18			
Fort Scott		3.25	18			
Frankfort		2.50	24			
Independence		3.50	18			
Oswego	12.45	5.00	23-24			
Paola		2.80	24			
Kentucky.						
Caddo		3.10	26-27			
Lexington		2.50	25-26			
Louisiana.						
Bastrop		3.22	1			
Lawrence		2.50	29			
Michigan.						
Benton Harbor	10.56					
South Haven		3.66	18			
Three Rivers	10.56	5.88	18-19			
Mississippi.						
Crystal Springs		3.20	25			
Lake		2.50	25			
Meridian		3.55	25-26			
Vaiden		2.52	1			
Waynesboro		2.50	25			
Williamsburg		2.55	25-26			
Missouri.						
Appleton		5.21	17-18			
Arthur		2.50	17-18			
Birch Tree		4.64	18-19			
Columbia		6.36	17-19			
Edgehill		2.96	19			
Eldon		7.78	17-18			
Fulton	10.35	7.65	16-18			
Grovedale		6.74	18-19			
Half Way		7.56	17-19			
Hannibal		2.70	18-19			
Hastain		8.25	17-19			
Hermann		4.80	17-18			
Houston		3.00	19			
Humansville		6.71	17-19			
Ironton		3.35	19			
Lamar		5.82	18-19			
Lamonte		2.63	18			
Lebanon	12.07	10.50	17-19			
McCune		5.81	18-19			
Mexico		2.92	18			
Mineralspring		5.92	17-19			
Mount Vernon	12.52	9.60	18-19			
Nevada		3.78	17-18			
New Haven		6.55	18-19			

TABLE XIII.—*Excessive precipitation*—Continued.

Stations.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Missouri—Cont'd.	*Inches.*	*Inches.*		*Ins.*	*h. m.*	
Oto		6.40	17-19			
Palmyra		3.60	18-19			
Phillipsburg	13.67	6.95	17-18			
Potosi		2.53	18-19			
Rhineland		6.25	18-19			
Rolla		6.13	18-19			
St. Charles		4.46	18-19			
Sarcoxie	11.22	9.03	17-19			
Stellada		5.52	17-19			
Unionville		2.53	24			
Vermont		3.10	17-18			
Virgil City		5.41	17-19			
Warrensburg		4.98	17-18			
Warrenton		5.31	17-18			
Wheatland		6.62	18-19			
Willow Springs		4.90	18-19			
New Jersey.						
Englewood		2.86	30-31			
New York.						
Boyds Corners		2.96	31			
Carmel		2.87	30-31			
North Carolina.						
Linville		4.15	20			
Rockingham		3.05	20-21			
Oklahoma.						
Burnett		2.58	18			
Do		2.84	23			
Keokuk Falls	10.75	3.03	18			
Do		3.50	24			
Sac and Fox Agency		4.10	18			
Oregon.						
Albany *a*	14.02					
Astoria	17.54	3.20	8-9			
Aurora	10.35					
Aurora (near)	10.87					
Bandon	21.67	2.79	14			
Do		3.49	19			
Brownsville	10.40					
Cascade Locks	19.60					
Comstock	13.13					
Corvallis *a*	11.21					
Corvallis (near)	14.98					
Detroit	18.67					
Eugene	10.47					
Forest Grove	14.76					
Gardiner	20.99	3.00	19			
Hood River (near)	12.83	3.00	19			
Hubbard	11.82					
Junction City	11.13					
Langlois	21.14	4.10	19			
Lorella		2.50	19			
McMinnville *a*	15.43					
McMinnville *b*	11.96					
Monmouth	12.00					
Mount Angel	12.01					
Nehalem	25.10	3.03	26			
Newberg	14.24					
Newport	19.86	2.62	19			
Salem *b*	11.16					
Salmon	22.04	3.60	19			
Do		3.20	26-27			
Sheridan	13.62					
Silverton	10.67					
Springfield	10.40					
Toledo	11.01	3.05	18			
Pennsylvania.						
East Bloomsburg		2.50	30			
East Mauch Chunk		3.35	30-31			
Girardville		2.52	30			
Tennessee.						
Lynnville		3.07	25			
Palmetto		3.54	25-26			
Texas.						
Albany		3.00	23			
Arthur City		3.27	19-20			
Ballinger		2.56	23-24			
Paris		4.20	19			
Sulphur Springs		3.31	19-20			
Washington.						
Aberdeen	21.08	3.19	8			
Ashford	13.10					
Cascade Tunnel	16.50					
East Clallam	25.50	3.32	8-9			
Fort Canby	14.17	2.89	8-9			
Grand Mound	13.09					
Lapush	15.76					
Mayfield	12.02					
Monte Cristo	28.14	3.70	9			
Neah Bay	23.88					
Olympia	14.96	3.12	9			
Port Crescent	10.74					
Pysht	20.50	3.29	8-9			
Silver Creek	12.91					
Tacoma	10.85	2.86	9			
Tatoosh Island	22.42	3.22	22-23			
Do		2.53	30-31			
Union City	17.27					
Vashon	12.85					

TABLE XIV.—*Maximum rainfall in one hour or less, December*, 1895.

Stations.	Maximum rainfall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
	Inch.		*Inch.*		*Inch.*	
Atlanta, Ga.†	0.16	30	0.26	30	0.40	30
Baltimore, Md.*						
Bismarck, N. Dak.*						
Boston, Mass.	0.17	22	0.27	22	0.47	22
Buffalo, N. Y.	0.10	21	0.16	21	0.48	21
Chicago, Ill.	0.03	19	0.05	19	0.16	18, 19
Cincinnati, Ohio†	0.02	30	0.03	30	0.17	30
Cleveland, Ohio†	0.02	23	0.04	23	0.17	26
Denver, Colo.					0.01	2
Detroit, Mich.†	0.01	21	0.02	21	0.07	21
Dodge City, Kans.*						
Duluth, Minn.*						
Eastport, Me	0.07	27	0.10	27	0.22	22
Galveston, Tex.	0.17	29	0.28	29	0.90	29
Indianapolis, Ind.*	0.02	18	0.04	18	0.18	18
Jacksonville, Fla.	0.20	30	0.25	30	0.45	30
Jupiter, Fla.	0.55*	1	0.80*	1	2.00	1
Kansas City, Mo.*	0.03	18, 24	0.05	18, 24	0.28	24
Key West, Fla.	0.25	9	0.26	9	0.33	9
Little Rock, Ark.	0.21	19	0.24	19	0.60	19
Louisville, Ky.†	0.05	26	0.08	25, 26	0.31	25
Memphis, Tenn.	0.12	1	0.18	1	0.60	1
Milwaukee, Wis.*						
Nantucket, Mass.†	0.05	2, 5	0.08	5	0.23	5
Nashville, Tenn.†	0.05	20	0.07	20	0.25	25
New Orleans, La.	0.19	29	0.29	29	0.58	29
New York, N. Y.	0.17	31	0.26	31	0.60	31
Norfolk, Va.	0.19	30	0.25	30	0.44	30
Omaha, Nebr.*						
Philadelphia, Pa.	0.06	2	0.10	2	0.25	2
Pittsburg, Pa.†	0.02	21	0.03	21	0.15	21
Portland, Me.†	0.07	30	0.13	30	0.30	22, 30
Portland, Oreg.	0.03	13, 19	0.06	6, 13	0.25	19
Rochester, N. Y.†	0.03	21, 26	0.06	21	0.26	21
St. Louis, Mo.†	0.04	17, 18	0.09	17	0.30	17
St. Paul, Minn.	0.02	28	0.04	28	0.06	28
Salt Lake City, Utah*						
San Diego, Cal.	0.05	16	0.06	16	0.12	16
San Francisco, Cal.	0.03	21	0.05	21	0.17	21
Savannah, Ga.	0.09	20	0.14	20	0.21	20
Seattle, Wash.	0.03	13	0.05	13	0.20	13
Vicksburg, Miss.	0.27	19	0.40	19	0.73	19
Washington, D. C.	0.20	26	0.24	26	0.29	26
Wilmington, N. C.	0.13	30	0.20	30	0.32	30

*Record incomplete. †Record partly estimated.

VIII X VI Chart I. Tracks of Centers of Low Areas, December, 1895.

Chart I. Tracks of Centers of Low Areas. December, 1895.

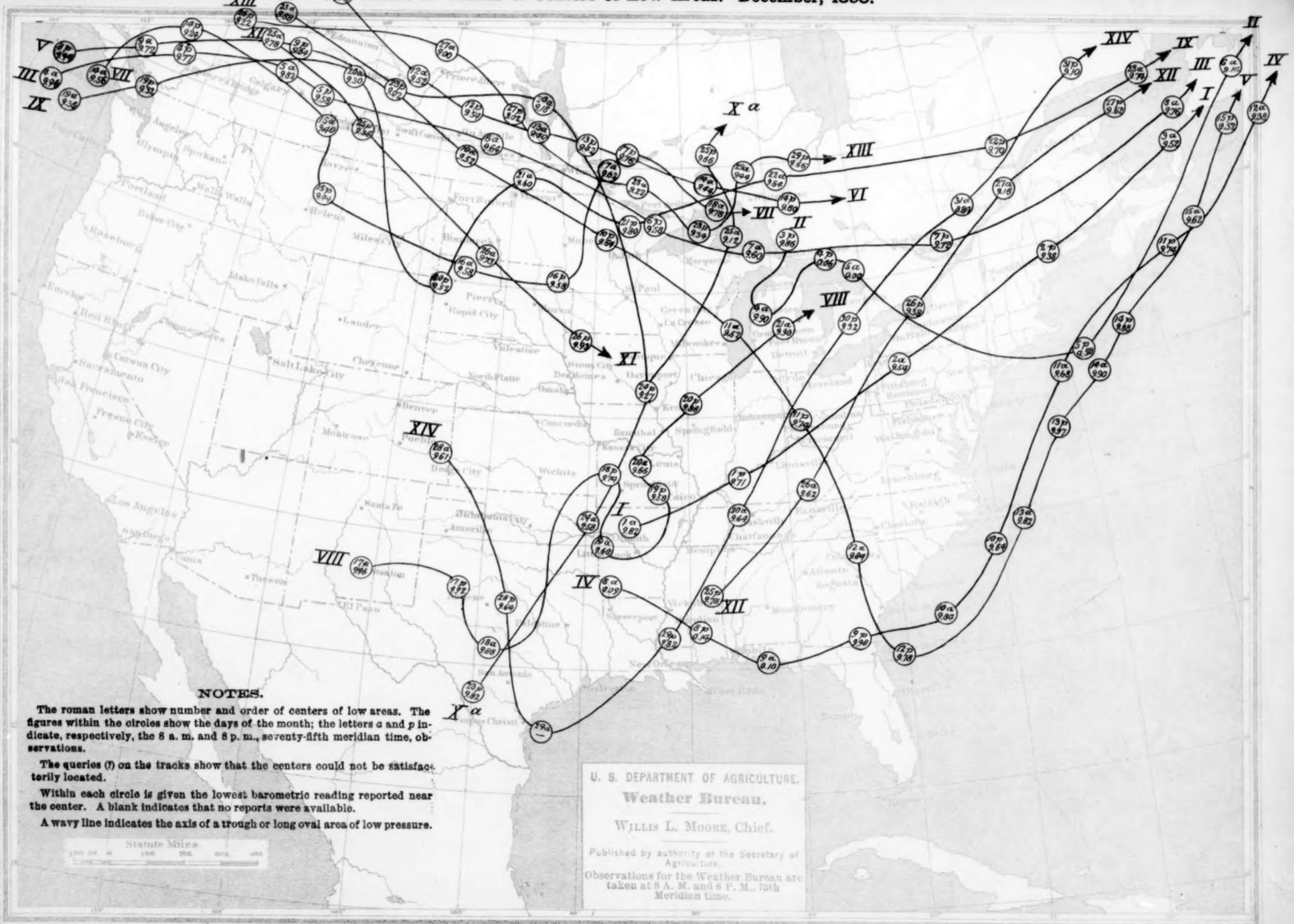

NOTES.
The roman letters show number and order of centers of low areas. The figures within the circles show the days of the month; the letters a and p indicate, respectively, the 8 a. m. and 8 p. m., seventy-fifth meridian time, observations.
The queries (?) on the tracks show that the centers could not be satisfactorily located.
Within each circle is given the lowest barometric reading reported near the center. A blank indicates that no reports were available.
A wavy line indicates the axis of a trough or long oval area of low pressure.
Statute Miles
U. S. DEPARTMENT OF AGRICULTURE.
Weather Bureau.
WILLIS L. MOORE, Chief.
Published by authority of the Secretary of Agriculture.
Observations for the Weather Bureau are taken at 8 A. M. and 8 P. M., 75th Meridian time.

Chart II. Isobars, Isotherms, and Resultant Winds. December, 1895.

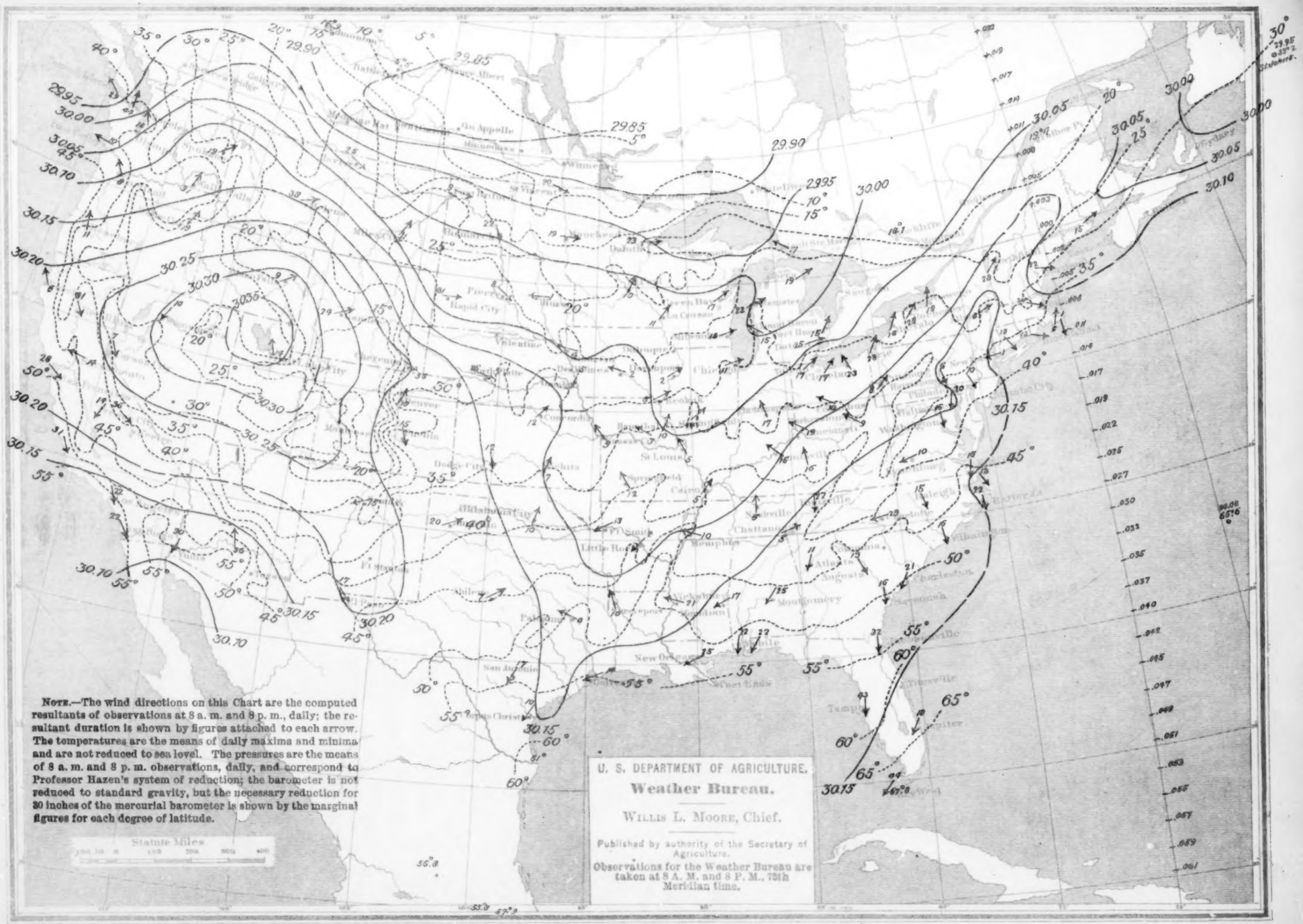

Note.—The wind directions on this Chart are the computed resultants of observations at 8 a. m. and 8 p. m., daily; the resultant duration is shown by figures attached to each arrow. The temperatures are the means of daily maxima and minima and are not reduced to sea level. The pressures are the means of 8 a. m. and 8 p. m. observations, daily, and correspond to Professor Hazen's system of reduction; the barometer is not reduced to standard gravity, but the necessary reduction for 30 inches of the mercurial barometer is shown by the marginal figures for each degree of latitude.
Statute Miles
U. S. DEPARTMENT OF AGRICULTURE.
Weather Bureau.
Willis L. Moore, Chief.
Published by authority of the Secretary of Agriculture.
Observations for the Weather Bureau are taken at 8 A. M. and 8 P. M., 75th Meridian time.

Chart III. Total Precipitation. December, 1895.

Chart III. Total Precipitation. December, 1895.

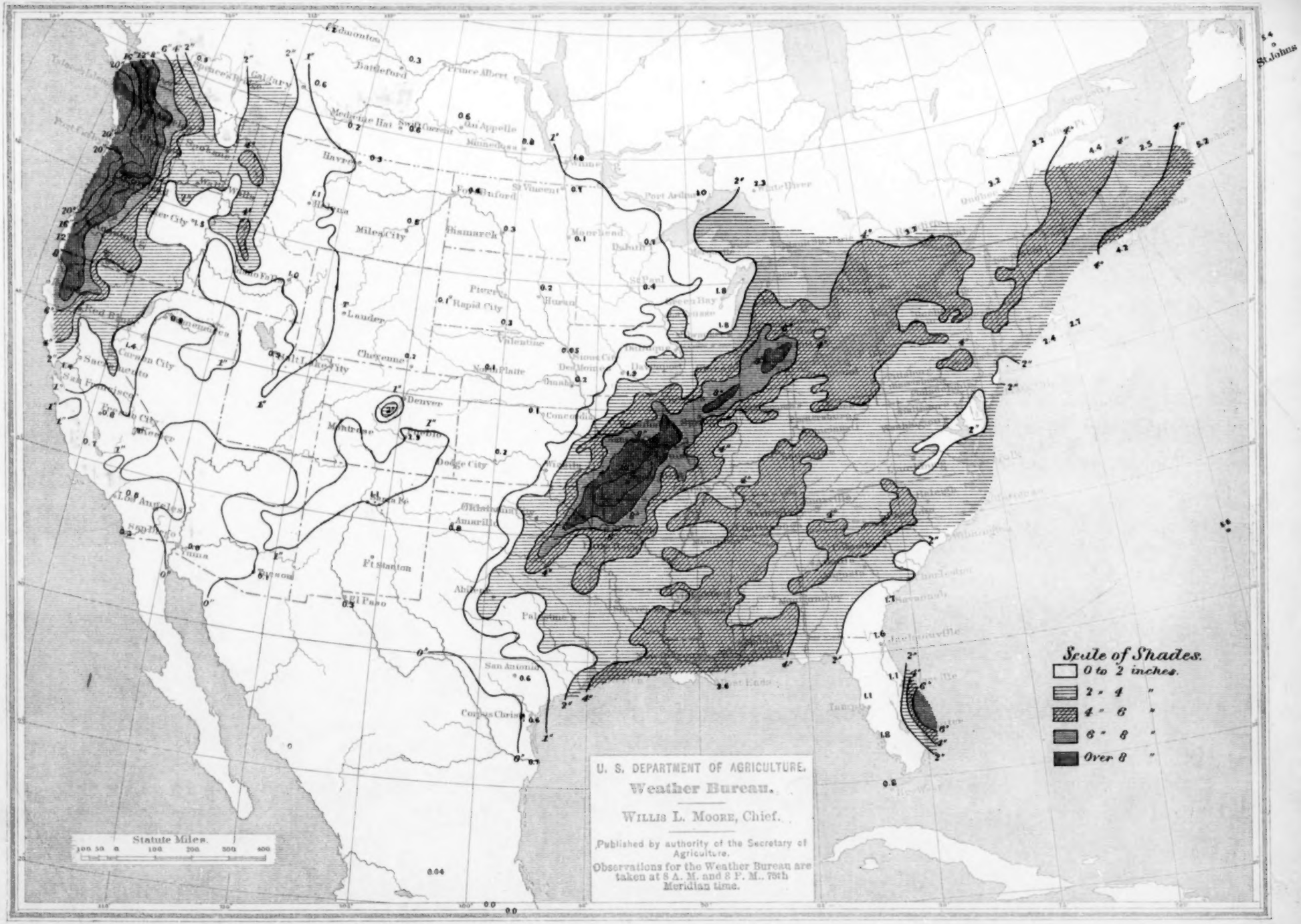
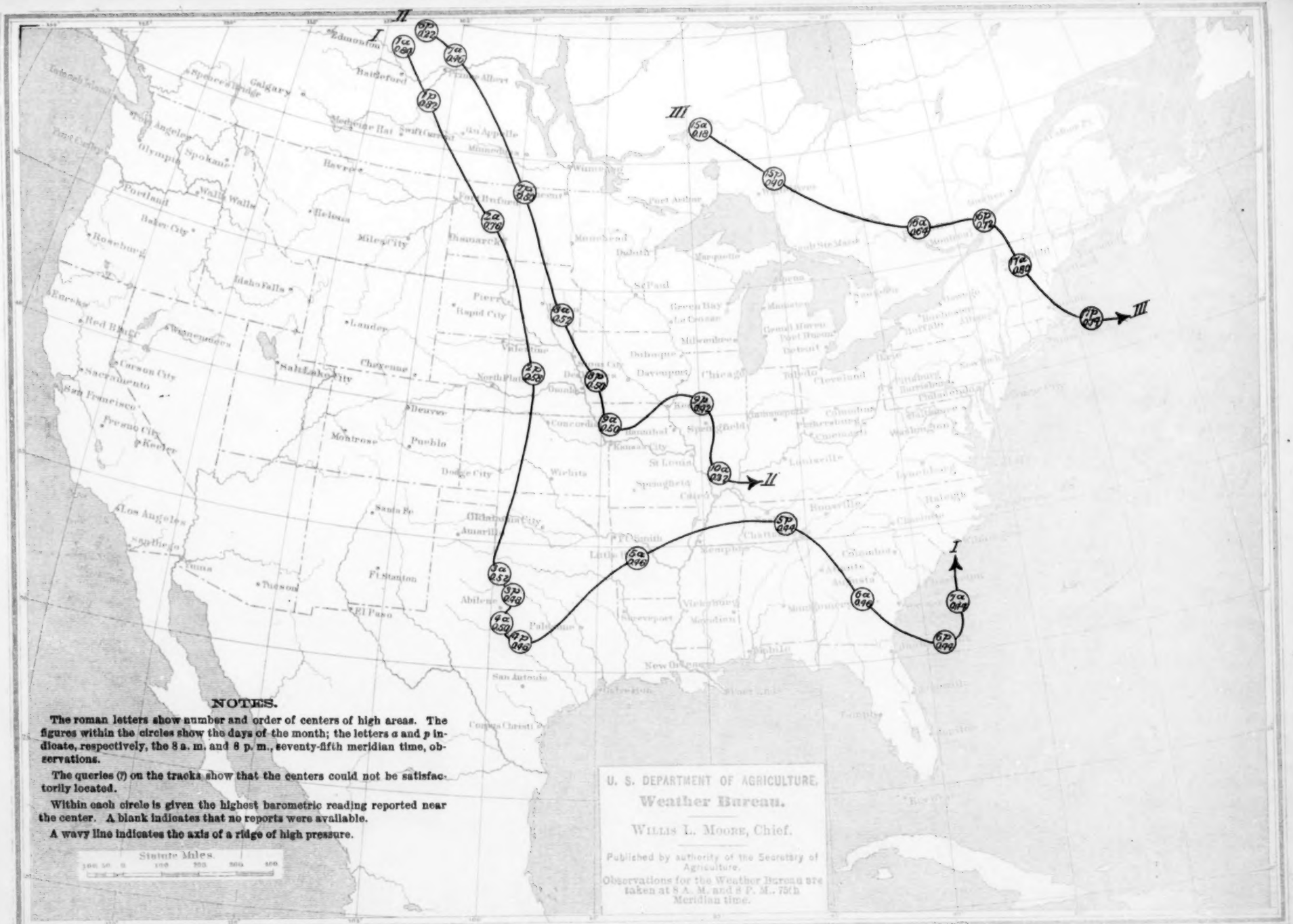


Chart IV. Tracks of Centers of High Areas, December, 1895

Chart IV. Tracks of Centers of High Areas. December, 1895.



NOTES.

The roman letters show number and order of centers of high areas. The figures within the circles show the days of the month; the letters *a* and *p* indicate, respectively, the 8 a. m. and 8 p. m., seventy-fifth meridian time, observations.

The queries (?) on the tracks show that the centers could not be satisfactorily located.

Within each circle is given the highest barometric reading reported near the center. A blank indicates that no reports were available.

A wavy line indicates the axis of a ridge of high pressure.

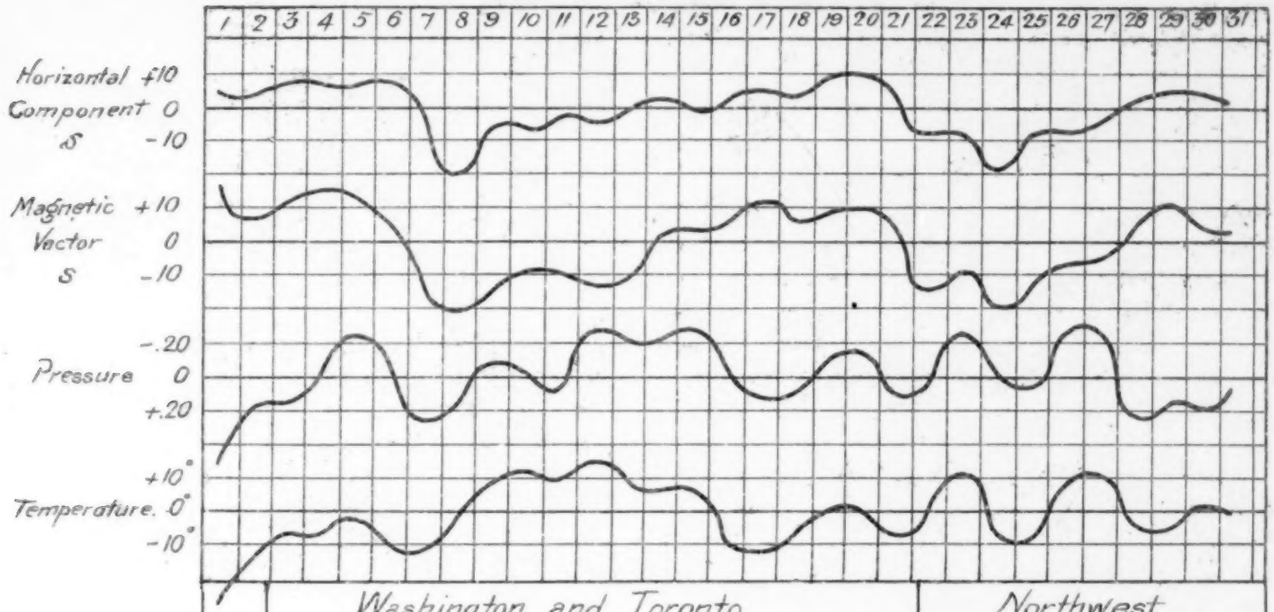
Statute Miles.

U. S. DEPARTMENT OF AGRICULTURE.
Weather Bureau.
Willis L. Moore, Chief.

Published by authority of the Secretary of Agriculture.

Observations for the Weather Bureau are taken at 8 A. M. and 8 P. M., 75th Meridian time.

Chart V. Relative Variations of the Deflecting Magnetic Forces, the Northwest Pressures, and Temperatures. December, 1895.



1895 December	Washington and Toronto. Deflecting Magnetic Forces.										Northwest. Pressure		Northwest. Temperature	
	H	D	V	dx	dy	dz	δ	S	α	β	P	ΔP	T	ΔT
1	64	7.7	35	+2	-4	-15	+5	+16	-72	296	30.66	+50	-5	-26
2	67	8.6	45	+5	+1	-5	+5	+7	-45	10	30.33	+19	9	-13
3	69	8.1	38	+7	-2	-12	+7	+14	-60	343	30.26	+13	14	-7
4	70	8.3	35	+8	-1	-16	+8	+17	-62	352	30.10	-1	16	-5
5	69	8.6	41	+7	+1	-9	+7	+12	-53	8	29.87	-23	19	-2
6	70	8.0	48	+8	-2	-2	+8	+8	-14	345	30.13	+4	12	-8
7	60	9.3	60	-2	+5	+10	-6	-11	+63	113	30.31	+23	9	-11
8	42	8.8	47	-20	+2	-3	-20	-20	-8	174	30.23	+17	16	-3
9	58	8.9	64	-4	+2	+14	-5	-15	+70	155	29.98	-7	27	+8
10	56	8.5	58	-6	0	+8	-6	-9	+53	180	30.02	-1	32	+14
11	59	8.3	59	-3	-1	+9	-3	-10	+72	200	30.06	+4	28	+10
12	58	8.7	60	-4	+1	+10	-4	-11	+68	166	29.68	-32	33	+16
13	61	8.8	62	-1	+1	+12	-1	-12	+86	135	29.76	-23	29	+12
14	63	8.3	52	+1	-2	+2	+2	+3	+45	297	29.76	-21	24	+8
15	63	8.8	46	+1	+1	-4	+1	+4	-76	45	29.68	-28	24	+8
16	62	8.7	45	+1	+1	-5	+1	+5	-79	45	29.94	0	8	-7
17	65	9.4	61	+4	+4	+11	+6	+13	+62	45	30.05	+12	4	-11
18	66	9.1	55	+5	+2	+5	+5	+7	+45	22	30.00	+9	8	-7
19	71	8.5	51	+10	-1	+1	+10	+10	+5	355	29.77	-13	13	-1
20	71	8.7	49	+10	0	-1	+10	+10	-5	0	29.71	-17	15	+1
21	66	8.3	51	+5	-2	+1	+5	+6	+11	338	29.99	+12	8	-6
22	54	8.8	38	-7	+1	-12	-7	-14	-30	172	29.81	-4	13	0
23	54	9.0	47	-7	+2	-3	-7	-8	-23	164	29.50	-33	26	+13
24	47	11.3	46	-14	+12	-4	-18	-18	-12	140	29.79	-3	6	-6
25	56	9.3	60	-5	+3	+10	-6	-12	+59	149	29.83	+2	4	-8
26	55	8.6	52	-6	-1	+2	-6	-6	+18	190	29.52	-28	19	+8
27	58	9.1	53	-3	+2	+3	-4	-6	+37	148	29.45	-35	24	+13
28	61	9.0	53	0	+1	+3	+1	+3	+71	90	29.99	+22	8	-2
29	64	8.7	38	+3	-1	-12	+3	+12	-76	340	29.95	+19	5	-5
30	64	8.6	52	+3	-2	+2	+4	-5	+26	327	29.94	+19	9	0
31	63	8.7	55	+2	-1	+5	+2	+5	+68	333	29.81	+7	9	0

Chart VI. Depth of Snowfall and Limits of Freezing Weather. December, 1895.

Chart VI. Depth of Snowfall and Limits of Freezing Weather. December, 1895.

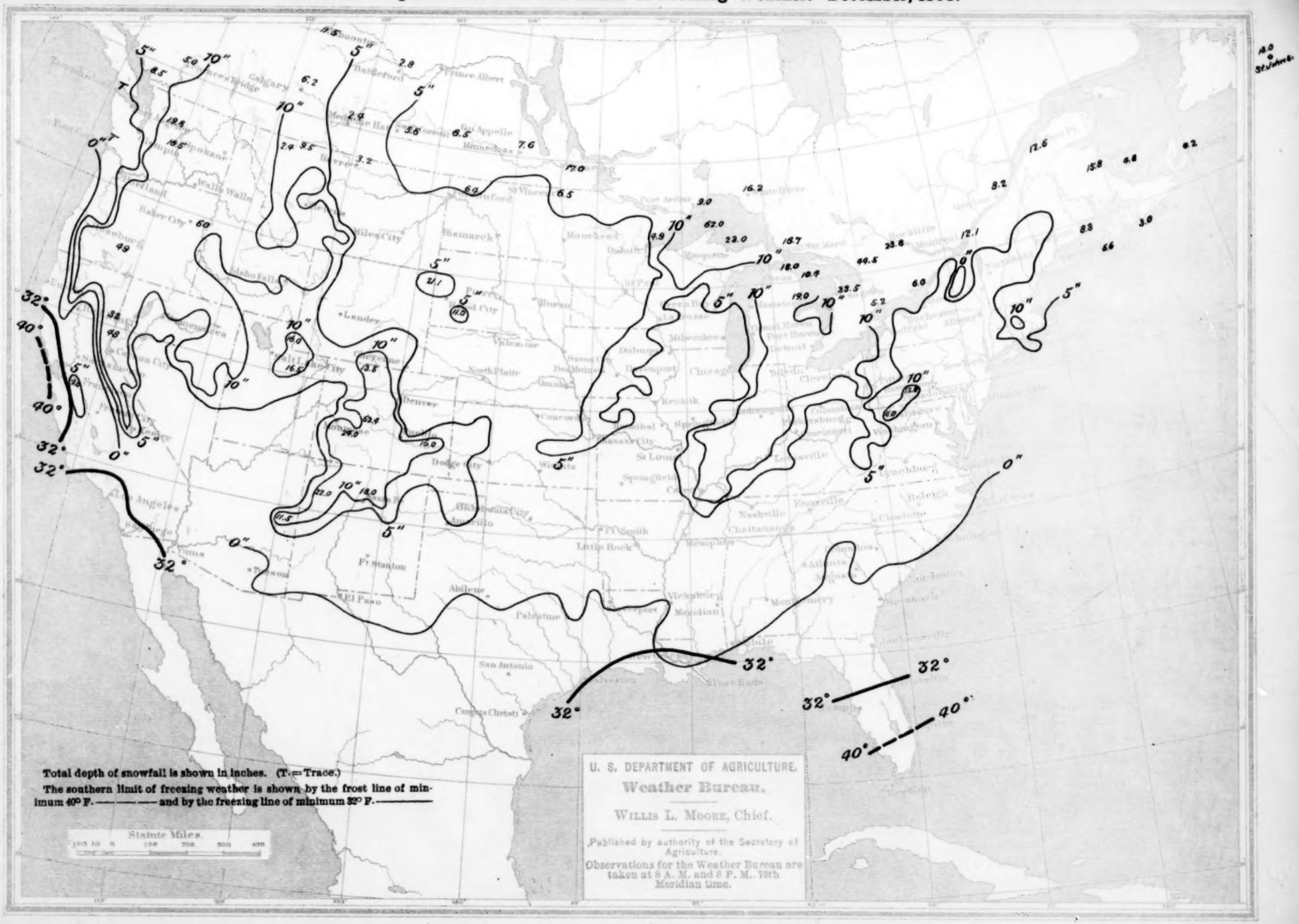

Total depth of snowfall is shown in inches. (T. = Trace.)
The southern limit of freezing weather is shown by the frost line of minimum 40° F. ———— and by the freezing line of minimum 32° F. ————
Statute Miles
U. S. DEPARTMENT OF AGRICULTURE.
Weather Bureau.
WILLIS L. MOORE, Chief.
Published by authority of the Secretary of Agriculture.
Observations for the Weather Bureau are taken at 8 A. M. and 8 P. M. 75th Meridian time.

Chart VII. Depth of Snow Lying on Ground December 31, 1895

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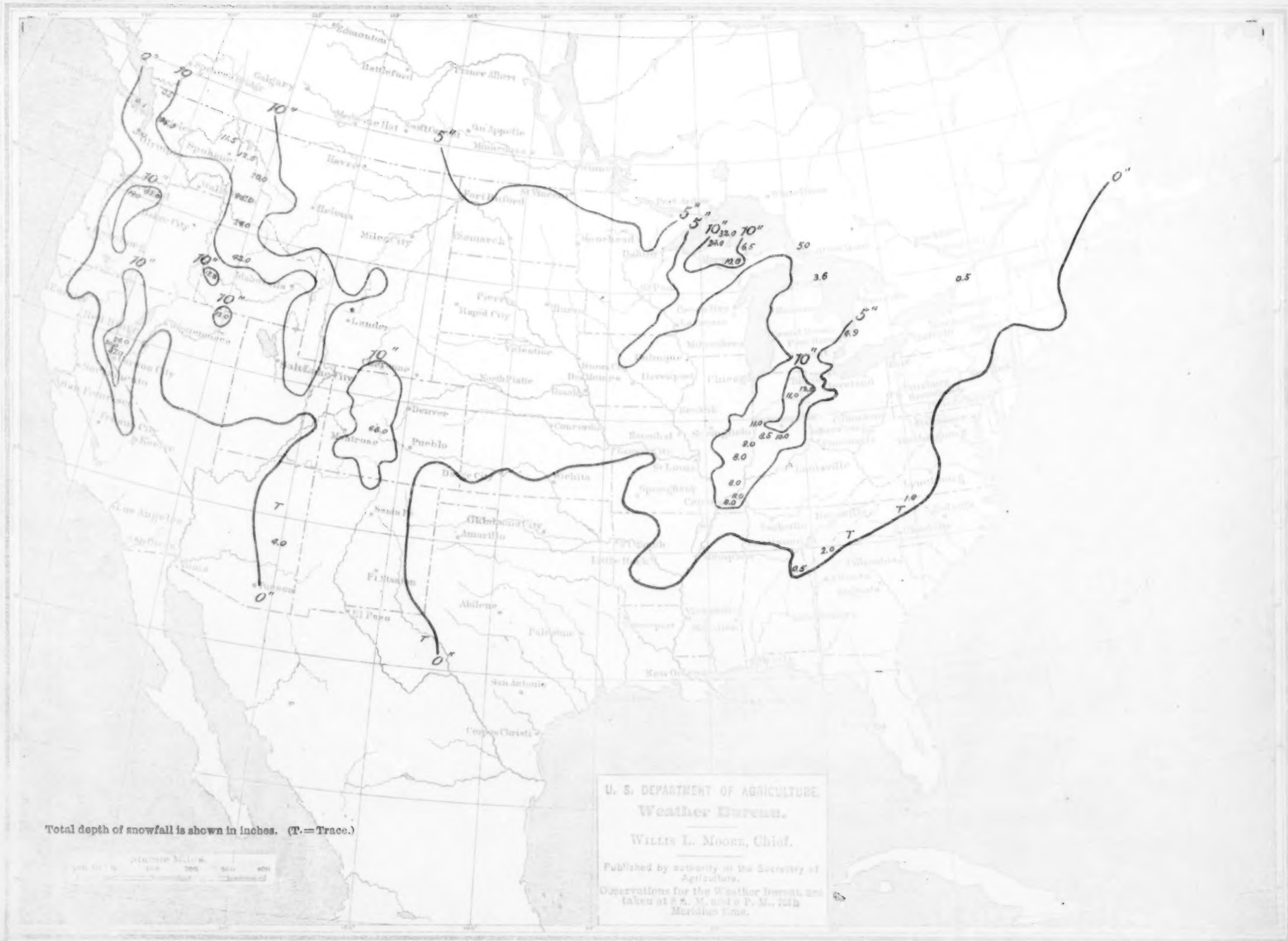
Total depth of snowfall is shown in inches. (T.=Trace.)
U. S. DEPARTMENT OF AGRICULTURE.
Weather Bureau.
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